

**CLASS 516, COLLOID SYSTEMS AND WETTING AGENTS; SUBCOMBINATIONS THEREOF; PROCESSES OF MAKING, STABILIZING, BREAKING, OR INHIBITING**

**SECTION I - CLASS DEFINITION**

The appearance of a term with an asterisk (\*) indicates that a definition for that term will be found in Section IV, Glossary.

Subject matter provided for in this class:

i) colloid systems (also called colloid dispersions\* or colloid suspensions), including aerosols, smokes, fogs, liquid foams, emulsions, sols\*, gels, coagulates, or pastes, shown by bold outline in the following table (note: gels may be composed of continuous or dispersed liquid phase in a continuous solid matrix):

COLLOID SYSTEMS		Continuous Phase		
		Solid	Liquid	Gas
Dispersed Phase	Solid	Solid sol	Sol	Smoke
	Liquid	Gel Paste	Emulsion	Fog
	Gas	Solid foam (e.g., xerogel, aerogel)	Liquid foam	(none)

ii) wetting agents\* (compositions for wetting surfaces, including spreading, penetrating, or leveling);

iii) subcombination compositions of colloid systems or wetting agents\* containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems or in wetting agents\*, which includes:

(a) compositions fully compounded for and intended to be made into a colloid system, such as an assemblage of compounds merely requiring non-material input (such as agitation) to effect a colloid system;

(b) compositions consisting of a potential dispersand\* combined with a colloid system making or stabilizing agent\*;

(c) compositions consisting of a mixture of colloid system making or stabilizing agents\*, or, of one such agent\* and an adjuvant\*, or, of a mixture of adjuvants\*, in each instance the composition lacking both the material\* to be dispersed and the material\* in which it is to be dispersed, including thickening, suspending, stabilizing agents\*, or protective colloid compositions;

iv) compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems;

v) processes of making or stabilizing the compositions or systems of i), ii), iii), or iv), hereinabove;

(vi) processes of breaking (resolving) or inhibiting colloid systems, by any means, physical or chemical, including, but not limited to, use of, alone or in combination, mechanical treatment, composition, compound, or temperature control (heat or cold);

in each case, where not elsewhere provided for, such as may be set forth in Search Class notes in Reference to Other Classes, below.

**SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS**

**A. Class 252**

This class is an integral part of Class 252, as shown by the position of the box identifying this Class in the Class 252 schedule (immediately following subclass 193, AMMONIA, ALKALI OR BASE, BINDANT CONTAINING, and immediately preceding subclass 363.5, SOLIDS WITH SOLUTION OR DISPERSION AIDS). As such, this class follows the schedule hierarchy, and is subject to the class definition and notes of Class 252 unless superseded by explicit statements in the Class 516 definition and notes.

The foreign patents and non-patent literature from 252/302+ were not reclassified into the Class 516 schedule and have been transferred to the Art Collections FOR 100 -FOR 163 in Class 516. The parenthetical classifications in the titles for FOR subclasses refer to the abolished US classifications from which these are collections were derived.

**B. Colloidally Sized Materials, Per Se, Are Not Placed in Class 516**

A compound, element, or composition of matter in finely-divided solid state is not considered to be sufficient by itself for placement in Class 516. Finely-divided compounds, elements, composites, and compositions of matter are placed in the US Patent Classification System (USPCS) where such compounds, elements, composites, and compositions of matter are classifiable.

#### C. Guidelines for OR (Original Reference) and XR (Cross Reference) Placement

Colloid systems (emulsions, foams, etc.) and surfactants therefor (emulsifying, dispersing, stabilizing, foaming agents\*, etc.) are widely used in industrial, commercial, and home applications. The USPCS provides for many specifically claimed applications/uses in various composition and process art classes and subclasses. Accordingly, colloid systems are found throughout the USPCS, i.e., in those places where it is specifically provided for. Where reference is made to art-class or art use class or specific art application or intended use such is understood to be shorthand for classes or subclasses in the USPCS including the provided-for compositions of Class 252.

To determine OR placement among various USPCS composition classes, see the section LINES WITH OTHER CLASSES AND WITHIN THIS CLASS in Class 252 Definition for a hierarchical list of composition classes and how it is to be used as a placement tool.

For placement of ORs, Class 516 generally provides only for patents which contain: (i) only generic claims, where generic refers to the claims having no recited application or intended use (NOTE: this is superseded by those art-classes, such as Classes 424, 508, and 510, which provide for both claims with specific art application or intended use and generic claims when the specification solely discloses that specific art application or intended use. See relevant class definitions or the Search Class notes herein to ascertain which classes provide for solely disclosed art.); or (ii) claimed specific art application(s) or intended use(s) which is(are) hierarchically inferior to Class 516 (based on the hierarchical list in the section LINES WITH OTHER CLASSES AND WITHIN THIS CLASS in Class 252) or is(are) NOT provided-for in the USPCS, whether or not generic claims are also present.

When Class 516 provides for the OR, placement of XRs outside of Class 516 is mandatory for all disclosed spe-

cific art applications or intended uses for which an art-class provides.

When a class other than Class 516 provides for the OR, placement of XRs in Class 516 is only mandatory when there is a claim which meets (i) or (ii) hereinabove and is optional when there is only a generic disclosure of Class 516 subject matter. See (6) Note, hereinbelow, for guidance on placing generic disclosure or claim. If none of these conditions are met, placement of an XR into Class 516 is unnecessarily duplicative since Class 516 is not intended to include colloid systems which are exclusively directed to subject matter for which USPCS explicitly provides an art-class.

#### D. Subcombination Compositions are Placed with Ultimate Intended Use Within Class 516

Processes of making or stabilizing a colloid system, subcombination compositions of colloid systems, and processes of making subcombination compositions are placed in the same subclass as the colloid system. Similarly, processes of colloid system breaking or inhibiting are placed along with the colloid system breaking or inhibiting agents\* or adjuvant\* compositions therefor. Similarly, methods of making wetting agents\* or subcombinations of wetting agents\* are placed with the compositions containing the wetting agent\*. Often this means that placement will be premised on the claims read in light of disclosure.

Patents may claim subject matter which may be placed in more than one mainline area, for example: (1) claiming both an aqueous colloid system and a method of using it as a colloid system breaker; (2) claiming a method of breaking a suspension colloid system which thereby produces a gel or floc colloid system; (3) claiming an emulsion colloid system with an ultimate intended use in making a gel colloid system; and (4) claiming a method of making a gel colloid system which passes through a sol colloid system phase. In these instances, the OR is placed in the first subclass of Class 516 which provides for claimed subject matter. This is the standard USPCS rule for OR determination within a class. When OR placement is other than the where the ultimate intended use is, such as examples (1), (2), and (3) hereinabove, cross-referencing is mandatory to the ultimate intended use area(s). Unclaimed, but disclosed, class subject matter, such as example (4) hereinabove, is subject to discretionary cross-referencing by the Examiner.

#### E. Subcombination Compositions, Intended for Making Colloid Systems or Wetting Agents\* Which are Pro-

vided for Outside of Class 516, May be Placed in Class 516

Class 516 provides for subcombination compositions of colloid systems or wetting agents\* even when the complete colloid system or wetting agent\* itself is properly placed in another class, unless such subcombination composition is specifically provided for in another class. For example, a subcombination composition of a mixture of surfactants which is intended for use in emulsifying latex is provided for in Class 516, even though the complete emulsion colloid system (the emulsified latex) is proper for placement in the Class 520 series because the Class 520 series does not provide for such subcombination. A claimed dispersing composition intended for dispersing latex droplets in an aqueous continuous phase is properly placed in Class 516, subclasses 53+.

#### F. Compounds Includes Polymers

The term compound is used to mean the more or less pure substances\* of Class 532-570 series as well as the synthetic resins of Class 520 series and the substances\* of Class 423. Thus, the term organic\* compound encompasses acetic acid as well as polyacrylamide, and the term inorganic\* compound encompasses water as well as silica.

#### G. Guidelines for Placing Generic Disclosure or Generic Claims

The placement of any generic subject matter must be premised on the generic subject matter rather than upon specific art application or intended use for which a classification is already made in an art-class. In other words, when a claim has already been classified in another class, then that basis of classification should not be used to infer a specific detail for a generic disclosure; this obviates placements which merely duplicate placement in an art-class. For example, a claimed surfactant mixture with the sole specific disclosed use of an aqueous phase laundry cleaning agent (which is properly OR in Class 510) and further generically described as useful for surfactant uses or other such broad language which does not afford determination of, or limitation to, a specific continuous phase of a colloid system, is placed in Class 516, subclass 9, because no continuous phase is specified and all the indented subclasses are based upon a specified continuous phase. If the broad language does specify subject matter so as to satisfy an indented subclass area, then placement is made in an indented subclass; multiple placements made be required in the case of generic and sub-generic type disclosures

References which altogether fail to disclose the particulars of the colloid system in which they are to be used (i.e., their ultimate intended colloid system is unspecified) are placed in an appropriate generic subclass. For example, if the claims are to an agent\* for a dispersion or emulsion colloid system (or to a dispersion or emulsion colloid system itself) and the patent disclosure fails to identify the continuous phase (dispersant\*), then proper placement is Class 516, subclass 9.

#### H. Colloid Systems Provided for Elsewhere

A concerted attempt has been made to specifically identify and list in section IV, below, those subclasses which specifically provide for colloid systems, related compositions, and related processes. However, even in classes which provide for colloid systems, there are not always specific subclasses for this subject matter. Hence, no guarantee can be made that every subclass containing colloid system subject matter has been identified and listed. Furthermore, even in cases where a subclass has specific reference to a colloid system, the hierarchy of that class must be considered to assess whether that provision in fact provides for all colloid systems otherwise proper for that class. Accordingly, the user should carefully assess whether the subclasses in other classes in the USPCS which specify a colloid system are the only subclasses in which to find colloid systems appropriate to that class. The user is advised to consult with an expert in the particular class of interest in order to obtain a complete assessment of where to search for any particular colloid system, composition, or process.

#### I. Glossary References

**Carbohydrate; Carbohydrate-Derivative** This definition follows the definition of Class 536, subclass 1.11.

**Mineral-Oil** The text used in this definition was adopted from Class 208.

**Organic; Organic Compound; Organic Group** When the expression organic or organic compound or organic group is used in this class (516), it means a compound or group which meets the requirements of the Class 260 definition.

**Resin, Natural** Class 530, subclasses 200+, contain information related to this definition.

**Rosin** Class 530, subclasses 200+, contain information related to this definition.

Spreading Agent Class 516, subclasses 198+, contain information related to this definition.

Tall Oil Class 530, subclasses 200+, contain information related to this definition.

Wetting Agent Class 516, subclasses 198+, contain information related to this definition.

The rules for determining class placement of the Original Reference (OR) for claimed chemical compositions are set forth in the class definition of Class 252 in the section **LINES WITH OTHER CLASSES AND WITHIN THIS CLASS**, subsection **COMPOSITION CLASS SUPERIORITY**, subsection **Composition Class Superiority**, which includes a hierarchical **ORDER OF SUPERIORITY FOR COMPOSITION CLASSES**.

### III. SUBCLASS REFERENCES TO THE CURRENT CLASS

#### SECTION III - SUBCLASS REFERENCES TO THE CURRENT CLASS

##### SEE OR SEARCH THIS CLASS, SUBCLASS:

- 9, for broadly defined surfactants.
- 9, for an agent for a dispersion or emulsion colloid system (or a dispersion or emulsion colloid system itself), where the continuous phase (dispersant) is not identified.
- 20+, and 53+ for an emulsion colloid system.
- 31+, and 77+ for a sol colloid system phase.
- 38+, 53+, and 77+ for an aqueous colloid system.
- 53+, for a claimed dispersing composition intended for dispersing latex droplets in an aqueous continuous phase.
- 98+, for a gel or floc colloid system.
- 98+, for use in making a gel colloid system.
- 98+, for a method of making a gel colloid system.
- 113+, for processes of colloid system breaking or inhibiting.
- 198+, for methods of making wetting agents or subcombinations of wetting agents, and the wetting agents or subcombinations of wetting agents.

#### SECTION IV - REFERENCES TO OTHER CLASSES

##### SEE OR SEARCH CLASS:

- 8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, appropriate subclasses. See the main class definition for the special use compositions classified therein, which include those compositions (or appropriate methods) which are claimed as specifically intended for such use, including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods (such as surfactant compositions, per se). Surfactants and colloid systems useful in Class 8 processes and compositions include, but are not limited to, wetting agents (e.g., with dyes), de-aerating agents\*, foam suppressants, foam carriers (e.g., for dyeing, finishing, coating). Areas known to have documents related to colloid systems or wetting agents include: subclass 477 for foam dye composition.
- 34, Drying and Gas Vapor Contact with Solids, for process and apparatus for (1) the separation of liquids from solids, i.e., drying, (2) the contacting of solids with either, or both, gases or vapors, (3) feather treatment. Areas known to have documents related to colloid systems or wetting agents include: subclasses 302+ for processes under that class definition of treating a flowable material wherein the material is congealed, thickened, jelled, or stiffened in any way.
- 40, Card, Picture, or Sign Exhibiting. Areas known to have documents related to colloid systems or wetting agents include: subclass 213 for smoke producing apparatus and systems limited to skywriting.
- 43, Fishing, Trapping, and Vermin Destroying, for methods and apparatus relating to trapping of wild animals, the catching of fish, especially food fish, and the destruction of all animal life obnoxious or pestiferous to man, not including catching and restraining devices for use with domestic animals or fowls nor the destruction of insects on such live stock, and not including bee-moth catchers. Areas known to have documents related to colloid systems or wetting agents include: subclasses 124+ for process and apparatus the primary object of which is to destroy or kill vermin without trapping them (particularly see subclasses 125+ for apparatus for creating or involving fumes or smoke when such fumes are used for destroying vermin and not for general disinfecting or similar purposes, subclass 132.1 for devices or processes under

- subclass 124 for destroying invertebrate animals, i.e., insects), cross-reference art collection 900 for apparatus for dispersing i.e., spraying, a liquid mass or jet of droplets used to destroy insects.
- 44, Fuel and Related Compositions, appropriate subclasses for compositions to be used either as a fuel or as a carbonaceous reductant in a metallurgical process; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. Areas known to have documents related to colloid systems or wetting agents include: subclasses 265+ for a gelled fuel composition, subclass 275 for candle making composition, subclasses 280+ for solid carbonaceous fuel dispersed in a liquid medium (such as dispersed coal), subclasses 301+ for liquid fuels comprising an emulsion.
- 47, Plant Husbandry, for apparatus and processes employed in treating the earth and its products and includes all inventions relating thereto that have not been especially provided for in other classes. Areas known to have documents related to colloid systems or wetting agents include: subclass 2, methods and devices for preventing the freezing of trees and plants and their fruit (such as misting).
- 51, Abrasive Tool Making Process, Material, or Composition, appropriate subclasses for materials or compositions designed for an abrading purpose; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use.
- 60, Power Plants, for process and apparatus which include driving a load by conversion of heat, pressure, radiant, or gravitational energy into mechanical motion, such as rockets. Areas known to have documents related to colloid systems or wetting agents include: subclass 252 for reaction motor (e.g., rockets) wherein the propellant is a gelatinous precipitate, subclass 39.464 for reaction motor having means to produce combustion products wherein the fuel may be a solid, slurry, emulsion, dispersion, or suspension.
- 62, Refrigeration, for processes and apparatus peculiar to removing heat from a substance, the resultant product, and processes and apparatus peculiar to handling the resultant product as a stored product, not elsewhere provided for.
- 65, Glass Manufacturing, for processes and/or apparatus for making stock or articles of glass and processes and/or apparatus for treating glass stock or articles. Areas known to have documents related to colloid systems or wetting agents include: subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.
- 71, Chemistry: Fertilizers, appropriate subclasses for plant fertilizing compositions; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. Areas known to have documents related to colloid systems or wetting agents include: subclass 64.08 for slurry or suspension, subclass 64.09 for gels, cross-reference art collection 900 for foams.
- 73, Measuring and Testing, (1) as the generic class for processes and apparatus for making a measurement of any kind or for making a test of any kind, and all such subject matter not provided for in other classes, (2) where the term "test" includes inspection, processes and apparatus for determining qualities by inspection being included where not provided for in other classes, (3) as the generic class for sampling and all sampling apparatus and processes not otherwise provided for (see subclasses 863+ and the notes thereto). Refer to the class definition for guidance on location of measuring and testing arts throughout the USPCS. Areas known to have documents related to colloid systems or wetting agents include: subclasses 19.01+ for a process or an apparatus for determining the nature or amount of gas in a substance other than gas, subclasses 28.01+ for measuring solid content of gas (e.g., particle), subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclass 60.11 for determining cleaning or foaming ability, subclasses 61.44+ for determining content or effect of a constituent of a mixture of plural liquids (e.g., multiphase liquid), subclasses 61.63+ for determining settling ability of sediment constituent of a liquid mixture, subclasses 61.71+ for

- determining content or effect of a solid component (e.g., particles) constituent of a liquid mixture, subclasses 64.41+ for a process or an apparatus for detecting or determining the composition of, a constituent of, or a property of, a liquid or a liquid suspension of a solid and the determination is made by measuring or detecting the ability of the liquid to coagulate, to form a clot, or to form a stiffened or solid colloid-like mass (e.g., gel)).
- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, appropriate subclasses for processes of obtaining free metals from metal compounds, ores, or mixtures, or preparing materials for such processes, or compositions for use in such processes, and for alloys and other compositions having a continuous phase of free metal, e.g., made from metal powder. Areas known to have documents related to colloid systems or wetting agents include: subclass 415 for pyrometallurgical processes involving amalgam and producing a foamed (porous) solid, cross-reference art collection 953 for subject matter of the class in which spheres are produced.
- 95, Gas Separation: Processes, appropriate subclasses for processes involving mechanical or manipulative operations or steps resulting in separation of a gas from a fluid mixture comprising (a) a gas and solid or liquid particles entrained therein, (b) a liquid and gas entrained therein, or (c) a plurality of gases, however Class 516 provides for compositions or processes for making or breaking colloid systems (foams, gels, emulsions, etc.) by utilization of agent\* compositions whether alone or combined with a mechanical or manipulative operation. Areas known to have documents related to colloid systems or wetting agents include: subclasses 57+ for processes using electric or electrostatic field (e.g., electrostatic precipitation, etc.), subclass 150 for contacting fluid mixture with a liquid and including foaming of liquid to aid in the separation, subclass 152 for contacting fluid mixture with a liquid and including coagulating or flocculating agent, subclass 155 for contacting fluid mixture with a liquid and including defoaming or antifoaming agent, subclass 157 for contacting fluid mixture with a liquid to degasify and including defoaming, subclasses 241+ for processes of degasification of a liquid (especially subclass 242 for defoaming, subclass 253 for emulsion breaking or multiple liquid separating). Also see Search Class reference to Class 239, below.
- 102, Ammunition and Explosives, for ammunition intended to be propelled by explosives and materials intended to be projected (pyrotechnic devices) and methods of use. Areas known to have documents related to colloid systems or wetting agents include: subclass 334 for apparatus for and methods of smoke generating (i.e., causing vapor, cloud, etc., to be formed by a burning), subclasses 335+ for pyrotechnics apparatus and corresponding methods designed to produce smoke, light, heat, and/or noise (e.g., fireworks display, amusement, flash photo, signal), subclass 365 for liquid or jelly incendiary apparatus or method of use, subclasses 367+ for apparatus for or methods of using an explosion to cause a liquid, solid, or gas to be scattered or spread about in the form of a mist, vapor, particles, or gas (e.g., noxious or incapacitating, plant, insect, animal, foliage, biological warfare/chemical warfare).
- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which are not elsewhere classified; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. Areas known to have documents related to colloid systems or wetting agents include: subclasses 162.1+ for coating or plastic composition containing a carbohydrate\* or carbohydrate-derivative\* which may be an emulsion (e.g., cellulose ether or ester), subclass 271 for dispersions of paraffin wax in water which contain more than just the material necessary to produce or stabilize the dispersion, subclass 277 for bituminous emulsions which contain more than just those components necessary to form or stabilize the emulsion, subclass 278 for bituminous dispersions which contain more than just those components necessary to form or stabilize the emulsion, subclass 646 for inorganic settable composition containing protein which sets or hardens when mixed with water or aqueous solutions, usually forming a hard, stone-like product, and forming foam, cellular, hollow, or porous material.
- 109, Safes, Bank Protection, or a Related Device, for I. Safes: all buildings and receptacles which have combined therewith (a) means in

- addition to their structure and/or (b) means built into their structure, for repelling or protecting their contents (including living beings) from explosion, penetration of missiles, other attacks by force or stealth (including burglary or larceny), fire, or for any other protective, or safe-guarding purpose not elsewhere provided for; II. Bank protection devices: banks, stores, or other related institutions, having means to protect or defend them and their personnel against a burglary or robbery attack; III. Related devices: all devices not elsewhere classified for preventing physical objects (including living beings) from being harmed by violence of any kind, or from getting into unauthorized possession of any person. Areas known to have documents related to colloid systems or wetting agents include: subclasses 29+ for devices of the class combined with means for releasing, generating and/or distributing gas, smoke, vapors and/or liquids either manually, automatically upon attack, or automatically in case of fire, which fluent material is normally, but not necessarily, toxic, noncombustible, or incapacitating and may normally, but not necessarily, be used to repel attacks and/or put out, prevent, or impede the action of a fire, and this includes devices relating to jails, where the purposes of this subclass are also present.
- 126, Stoves and Furnaces, for apparatus for the application of heat, including cooking and heating stoves, hot-air furnaces, and accessories; hot-air radiators and heating drums; open water heaters, steaming apparatus, dampers, fireplaces, and stovepipes; the fuel burner when combined with the stove or furnace structure; combinations of a particular stove or furnace structure of the type classified in this Class 126 with a closed water heater or steam generator; water heaters of only the nonpressure type unless they are structurally tied to the stove or furnace or form a necessary part thereof, and grates of general use in stoves, hot-air furnaces, or boiler furnaces. Areas known to have documents related to colloid systems or wetting agents include: subclass 59.5 portable devices for generating heat or smoke for protecting orchards from frost (e.g., smudge pots).
- 134, Cleaning and Liquid Contact With Solids, for apparatus for or processes of cleaning, which may include use of detergents, or for contact-
- ing solids with liquids for any purpose not provided for in another class.
- 137, Fluid Handling, for residual subject matter relating to fluid material handling, and processes, systems, combinations, subcombinations, and certain elements pertaining thereto not otherwise classified. Areas known to have documents related to colloid systems or wetting agents include: subclass 13 for processes in which flow of fluent material is facilitated by the addition of material which affects the flow characteristics of the fluent material (e.g., suspending agent, viscosity reducing agent), or by the application of heat or other forms of energy, subclasses 170.1+ for apparatus for foam control in gas charged liquids.
- 138, Pipes and Tubular Conduits, for: A. Tubular members of definite or indefinite length including wall structure of the tubular members, the end structure of the tubular members of definite length, if not elsewhere classifiable; B. Fluid pressure compensators (e.g., accumulators or cushioning devices), flow regulators, or baffles not restricted by structure to use with any particular art; C. Devices for thawing frozen fluid in pipes, for preventing the fluid in the pipes from freezing and for preventing the pipe from bursting if the fluid freezes; D. Pipes with closures and plugs where tied with the structure of the pipe or limited by structure to use with a pipe; E. Methods and apparatus for repairing pipes where not elsewhere classifiable. Areas known to have documents related to colloid systems or wetting agents include: subclasses 40+ for some devices disclosed for the purpose of forming a mixture or emulsion of a plurality of fluids but in which the claims are limited to the structure of the conduit and the flow restrictor.
- 141, Fluent Material Handling, With Receiver or Receiver Coacting Means, for: (1) the transfer of fluent material, gaseous, liquid or flowable granular solids, through a flow confining system, the source and terminal or receiver parts of which are normally separable, i.e., one or both parts are portable or are otherwise capable of or intended to have a utility in their separated condition. Such utility ordinarily lies in portability of a separated part, either for use of the contents material in another place, or for use of one of the system parts with another complementary part. See the class definition for details of the subject matter of this class.

- Areas known to have documents related to colloid systems or wetting agents include: subclass 3 for processes in which an aerosol type dispenser type receiver is filled by steps involving manipulation of the dispenser as an incident to or aid to refilling or filling the supply chamber (i.e., the material to be dispensed, powder or liquid, is dissolved in or carried by a vaporizing propellant which forms the charge of the dispenser).
- 148, Metal Treatment, appropriate subclasses for compositions employed in the treatment of solid metal such as for soldering, fluxing, heat treating, tempering, or otherwise modifying solid metal; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use.
- 149, Explosive and Thermic Compositions or Charges, appropriate subclasses for explosive and thermic compositions and methods of preparing or treating such compositions, where the latter are used to produce usable heat or flame or by-products resulting from the use of such compositions (e.g. smoke flares); including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. Areas known to have documents related to colloid systems or wetting agents include: various subclasses based on active composition for explosive or thermic compositions which may be gels or pastes or may be intended to yield smoke as result of combustion (particularly subclasses 29+, 37+, and 78+), subclasses 17+ for compositions containing particulate material dispersed substantially entirely within a solidified or matrix medium and which are characterized by dispersed phase within a continuous phase, subclass 108.4 for smoke affecting composition (e.g., coloring), subclass 108.8 for compositions containing a stability or viscosity agent (e.g., gelling, thickening, thinning, liquefying, etc., agent, a stabilizer or unstabilizer (activator), a burning rate modifier), cross-reference art collection 110+ for compositions or processes reciting or disclosing a reference to a particular size or dimension of the particles of at least one of the ingredients or the size or dimension of all or part of the composition in particulate form, cross-reference art collection 117 for smoke generating or weather modifying composition with a resin, and cross-reference art collection 118 for composition containing a resin dissolved in the continuous phase of a gel.
- 156, Adhesive Bonding and Miscellaneous Chemical Manufacture; see the Class 156 definition for presentation of the diverse content of this class. Areas known to have documents related to colloid systems or wetting agents include: subclass 78 for processes of bonding of lamina which include the step of forming pores by introducing a gas under pressure to the interior of at least one lamina or by generating a gas in-situ within such lamina.
- 162, Paper Making and Fiber Liberation; see the Class 162 definition for presentation of all categories of provided subject matter, which includes but is not limited to (A) processes for the liberation, recovery or purification of fibers as individual staple fibers or as a pulp of such fibers, including cellulosic fibers, from a fibrous containing material by use of a reagent which exerts some chemical or solvent action upon the fibrous material, (B) reagent compositions employed in the processes A above, and processes of preparation of such compositions, not otherwise provided for, or (C) processes including the deposition of fibers from a liquid suspension thereof in order to form an interfelted product and processes of treatment of the deposited fibrous product prior to the final drying thereof; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. Areas known to have documents related to colloid systems or wetting agents include: subclasses 1+ for processes of liberation (especially subclasses 63+ for processes wherein the fibrous material is forcibly and directly contacted with a (reactive or nonreactive) gas, vapor, or mist during digestion or chemical treatment for some purpose other than drying, subclasses 70+ for compositions specifically employed in or intended to be employed in the class provided for processes), subclasses 100+ for processes of depositing fibers from a liquid suspension thereof to form an interfelted fibrous product (paper), subclass 187 for processes of forming an interfelted fibrous product from a hydrated or partially gelatinized fiber and the product per se, and Digest 3 for wetting agent.
- 166, Wells, for processes or means not otherwise classified comprising (1) shafts or deep borings



- in the earth, commonly known as wells, for the extraction of fluids from the earth, (2) shafts or deep borings in the earth for Inserting a fluid into the interstices of a porous earth formation, usually to enable withdrawal of fluid from a producing output well, (3) apparatus peculiarly adapted for treating a well or for use in or with a well, or (4) processes of using, making, or treating a well. Areas known to have documents related to colloid systems or wetting agents include: subclasses 244.1+ for processes of treating or operating a well which may include colloid system (e.g., gel or emulsion) forming or breaking (especially subclass 309 for processes which produce foam or gas in a well by a foaming or gas producing material) in a well, which includes significantly claimed process steps of well treating or well operation. See also the notes and Search Class references in Class 166 subclass 244.1.
- 169, Fire Extinguishers, appropriate subclasses for fire extinguishing apparatus and processes and fire preventing apparatus; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. Areas known to have documents related to colloid systems or wetting agents include: subclass 44 for processes involving the mixing of fire extinguishing components.
- 184, Lubrication, for devices employed to lubricate bearing parts in a machine where such lubrication device forms no part of the machine structure. Areas known to have documents related to colloid systems or wetting agents include: subclass 6.23 for devices which include means to destroy or remove gas or vapor bubbles dispersed in the lubricant.
- 201, Distillation: Processes, Thermolytic. Areas known to have documents related to colloid systems or wetting agents include: subclass 9 for process including a step of surface treating solid carbonaceous material to reduce or prevent agglomerating or foaming or swelling during distillation.
- 202, Distillation: Apparatus. Areas known to have documents related to colloid systems or wetting agents include: subclass 264 for apparatus for breaking foam during distillation.
- 203, Distillation: Processes, Separatory, for a distillation process not otherwise provided for.
- 204, Chemistry: Electrical and Wave Energy, for processes involving electrolysis, producing chemical changes by use of electrical or wave energy, involving electrophoresis or electro-osmosis, or electrical separation or purification of liquids (including breaking or resolving of colloid systems, such as, emulsions). Compositions which are the result of a wave energy process are classified with the art use of said composition. Areas known to have documents related to colloid systems or wetting agents include: subclasses 193+ for apparatus for electrical separation or purification of liquids, subclass 414 for apparatus for electrolysis in analytical or testing system which uses a gel electrolyte, subclasses 450+ for processes of separating or purifying using electrophoresis or electro-osmosis (especially subclasses 456+ for processes of gel electrophoresis, subclass 514 for separation of hydrocarbon oil in an aqueous system (e.g., emulsion breaking)), subclasses 554+ for processes (e.g., electrostatic separation of a liquid) involving (a) electrical (including simultaneous electrical and magnetic) separation or purification of a liquid, or (b) magnetic treatment, per se, when some effect other than mere separation is desired or produced (especially subclasses 563+ for process which involves breaking emulsion or dispersion by agglomerating or accreting suspended constituents in a predominantly hydrocarbon liquid, subclass 573 for process which involves breaking emulsion or dispersion by agglomerating or accreting suspended constituents in other than a predominantly hydrocarbon liquid).
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, for subject matter defined in the class of which it is an integral part. Areas known to have documents related to colloid systems or wetting agents include: subclass 74 for the reproduction or formation of powder, flakes, or colloid-sized particles by electrodeposition in which the deposit does not remain with the base upon which deposition is made and compositions therefor, subclasses 334+ for processes or compositions for the preparation of chemical compounds or of elements by means of electrolytic action (especially subclass 352

- for processes wherein an emulsion, dispersion, or suspension is utilized as the electrolyte or bath, subclass 353 for processes wherein an electrolyte system having two or more separate, immiscible layers are utilized), subclass 699 for electrolytic erosion of a workpiece for shape or surface change (e.g., etching, polishing, etc.) (process and electrolyte composition) wherein the electrolyte is held into contact with a portion of the workpiece surface by surface tension or capillary action, subclasses 687+ for processes directed to the chemical modification of material by electrolysis, including products thereof where not provided for elsewhere and electrolyte compositions for use therein (especially subclass 699 for processes in which the material is organic which contains (a) a natural or synthetic elastic polymer commonly known as rubber (e.g., caoutchouc, neoprene, etc.) or (b) a dispersion or emulsion of a natural or synthetic elastic polymer in water commonly known as latex).
- 208, Mineral Oils: Processes and Products, appropriate subclasses for (1) processes for the recovery or treatment of natural occurring mineral oil which result in the production of a purified or modified mineral oil or of coke, (2) mineral oil products of the above processes or mixtures thereof which include only mineral oil components, (3) processes for the recovery of oily liquid or tar-like hydrocarbonaceous material from a solid mineral source; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use; however Class 516 provides for breaking of emulsions of mineral oil when not combined with some other treatment of the mineral oil, i.e., Class 516 provides for effecting breaking or inhibiting by merely adding an agent\* for that purpose and permitting or causing separation (settling) of phases. Areas known to have documents related to colloid systems or wetting agents include: subclass 29 for treatment or recovery of wax wherein the oil-paraffin separation involves the formation of an emulsion or dispersion (emulsion dewaxing), subclasses 39+ for processes of removing water from asphalts, tars, pitches or resins, subclasses 177+ for mere removal of a colloid system stabilizing agent from a mineral oil for the purpose of preventing formation of an emulsion or colloid system containing the mineral oil (particularly subclasses 179+ for processes of removing water from used mineral oils, subclasses 187+ for the separation of water emulsified with the oil, subclass 263 for removing undesirable organic acids or phenolic components from mineral oils).
- 209, Classifying, Separating, and Assorting Solids, for methods and apparatus for separating solid materials and assorting or segregating them in grades or classes according to physical characteristics (separating solids from solids in general). Areas known to have documents related to colloid systems or wetting agents include: subclass 5 for methods or apparatus for treatment of materials or items prior to their separation to facilitate the latter in which certain components of a mixture may be deflocculated or dispersed relatively to others or by which certain components may be flocculated (this subclass receives only methods and apparatus in which the deflocculation or coagulation is contributory to a subsequent separation of some components from others), subclasses 163+ for methods and means wherein some material is caused to adhere selectively (i.e., to some constituents and not to others) which so lightens the material constituents to which it is attached as to cause them to float on the liquid, while the other constituents are not floated (e.g. bubbles are caused to attach to some components of a material or mixture of solid materials and not to others, the components to which the bubbles are attached being caused thereby to float on the surface of the liquid).
- 210, Liquid Purification or Separation, for treating water or waste liquid, and when not more specifically provided for, for treating liquids in general or of any kind: (1) process and apparatus for (a) separating a component from (b) purifying or (c) effecting a change in water or waste liquid, such process or apparatus not being more specifically provided for in another class; (2) process of treating liquids in general and treating liquid compositions of either general or diverse utilities; (3) apparatus not provided for in other classes, for performing the foregoing processes and treating liquids of any kind; (4) filter materials or compositions peculiar to the above-mentioned processes; and (5) processes for purification of liquids containing hazardous or toxic waste to produce a nonhazardous or nontoxic product. Class 516 is the locus for the breaking of colloid systems generically claimed and provides for (a) the separation or purification of liquids, generally

- claimed, when performed by a Class 516 process, such as by breaking an emulsion, dispersion, or foam, and for such processes further including ancillary steps, such as, decanting, or passing through a separatory funnel, etc., or (b) processes in which recovery is intended of both water and another product. Class 210 provides for (a) processes which include a step of colloid system resolution of liquids, generally claimed, when combined with a step of separation of a diverse component, unless that step is also a Class 516 step (i.e., multiple Class 516 steps are proper for placement in Class 516), or (b) a step of colloid system breaking, per se, for the purpose of obtaining water, wherein the water may be intended for use or intended to be made suitable for disposal, thus, decontaminating of sewage waste water to be dumped into the ocean using an emulsion breaking step is proper for Class 210. Areas known to have documents related to colloid systems or wetting agents include: subclasses 600+ for process under the class definition (particularly subclass 608 for processes of using living organism to regulate floating constituent, subclass 609 for processes of using living organism and including dewatering sludge, subclasses 634+ for liquid/liquid solvent or colloid dispersion extraction, subclass 696+ for processes of preventing, decreasing, or delaying precipitation, coagulation or flocculation, subclasses 702+ for processes in which a liquid is treated by a chemical or physical agent to cause a dissolved constituent to separate from the solvent or to cause a constituent, dispersed in such a finely divided state that it is not filterable or settleable, to agglomerate, coagulate, coalesce, or flocculate (e.g., subclasses 703+ for flotation using a specified precipitant, coagulant, or flocculant, subclass 708 for including emulsion breaking, subclass 737 for process including the step of changing the temperature, subclass 738 for process including agitating, stirring, or inducing turbulence), subclasses 749+ for processes wherein a material is added which chemically reacts with a constituent in the liquid), cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 923 for using mechanical means, cross-reference art collection 924 for using physical agent, 925 for using chemical agent).
- 222, Dispensing, for dispensers; this is the generic class for processes and apparatus for dispensing material, and takes all such subject matter that must be classified on such basis and not provided for in other main classes, this class is not limited as to the character of the materials dispensed which may be in any physical state, i.e., it may be in a gas, vapor, liquid, viscous, paste-like or solid state and if in a self sustaining state may have any form or shape. See the class definition for presentation of the diverse content of this class. Areas known to have documents related to colloid systems or wetting agents include: subclasses 394+ for dispensers in which the material is caused to discharge from the container by fluids under pressure that directly contact the material to be dispensed, subclass 635 for pressurized aerosol container.
- 239, Fluid Sprinkling, Spraying, and Diffusing, for processes or apparatus for dispersing fluent materials, liquids, or gases, see the class definition for presentation of the diverse content of this class. Areas known to have documents related to colloid systems or wetting agents include: subclasses 2.1+ for processes including spraying or dispersing and intended for weather control or modification including fog clearing or making, snow making, cloud dispersing, rain making (i.e., either (a) to wet a surface or (b) to precipitate moisture from the atmosphere), subclasses 8+ for processes of mixing a gas with the material to be dispersed, subclasses 14.1+ for apparatus for weather control, such as snow making.
- 241, Solid Material Comminution or Disintegration, for the generically claimed subject matter of comminuting solid material in a fluid to form or improve a non-colloid suspension. Processes of forming non-colloid suspensions or dispersions of solids in fluids, and in which the ingredients of the non-colloid suspensions or dispersion are not claimed with such particularity as to form a basis for classification in some appropriate composition class, are classified in Class 241. In general, Class 241 provides for all apparatus for forming suspensions of solids in fluids by comminution, whether such suspensions are disclosed as colloid-sized or not. Areas known to have documents related to colloid systems or wetting agents include: subclasses 15+ (particularly subclass 16) for processes for producing non-colloid suspensions of a solid in a liquid by comminuting operations and subclasses 38+ for apparatus which may produce suspensions of a solid in a liquid

- by comminuting operations, whether such suspensions be disclosed as colloidal or not.
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use, provided the subject matter is hierarchically superior within Class 252. Areas known to have documents related to colloid systems or wetting agents include: subclass 3, 6.5, and 8.05 for fire extinguishing foams, subclasses 610+ for fire retarding compositions in the form of dispersion or colloid system, subclasses 8.57, 8.61+, 8.81+, and 8.91+ for various specialized compositions for leather, fur, or textile treating, subclass 61 for froth flotation compositions used in physical separation, subclasses 71+ for compositions for thickening liquids for use as hydraulic fluids, subclasses 182.11+ for compositions containing a single reactant or plural reactants specialized or designed for use in subsequent reactions with other materials, but not with each other (e.g., for producing foams), subclasses 186.1+ for compositions for bleaching by oxidation, or in other oxidation of extraneous substances, or in generating oxygen, subclasses 175+ for compositions for treating water to soften or purify it, to precipitate impurities in it, or to inhibit formation of scale or incrustation in steam boilers or other water containers, subclass 194 for a composition which is designed to remove or bind water which may be in the form of a gel or which forms a gel, subclasses 299.01+ for liquid crystal composition, subclass 363.5 for finely divided solids combined with an agent to facilitate dispersion, subclass 367.1 for soap containing compositions (these are alkali-metal (i.e., Li, Na, K, Rb, or Cs) salts of unsubstituted or hydroxy-substituted, saturated or unsaturated, higher fatty acids, or of rosin (abietic) acids) which are of general utility and lack any shape or structure to adapt them for use as cleaning agents, subclasses 610+ for fire retarding compositions in the form of dispersion or colloid system, subclasses 634+ for radioactive compositions in the form of sol solution or gel.
- 261, Gas and Liquid Contact Apparatus, for apparatus specially adapted to produce an intimate contact between gases and liquids to exchange properties or mutually modify conditions.
- 264, Plastic and Nonmetallic Article Shaping or Treating: Processes, for diverse Subject matter under that class definition, such as molding, or liquid or melt comminuting, and provided that in each instance the materials are other than glass or metal. Areas known to have documents related to colloid systems or wetting agents include: subclasses 3.1+ for processes making gelled explosives which include a molding step or otherwise proper for this class, subclasses 5+ for processes of forming solid particulate material directly from a molten or liquid mass, e.g., liquid comminuting to form colloid-sized particles.
- 361, Electricity: Electrical Systems and Devices, for understanding of the scope of this class, see the class definition. Areas known to have documents related to colloid systems or wetting agents include: subclass 526 for solid electrolytic capacitor of paste or gel.
- 366, Agitating, for processes and apparatus operating on fluid, viscous, or fluent particulate material solely for causing portions of the material to move irregularly with respect to each other so as to intermix, except for processes which form colloid systems, such as emulsifying or foaming, which are proper for compositions classes for the claimed specified use compositions, and for Class 516 for non-specified use compositions (generic). Areas known to have documents related to colloid systems or wetting agents include: subclasses 69+ for apparatus which may be used for working liquid into a gel, subclasses 101+ for apparatus which includes agitation and injection of gas which may be a foam, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, subclasses 279+ for apparatus with rotatable stirrer which may be used for making lather or foam, cross-reference art collection 604 for mixing apparatus for making foam or lather, cross-reference art collection 605 for mixing apparatus for stirring of paint.
- 392, Electric Resistance Heating Devices, for devices commonly known as electric heaters, electric-heating metal working apparatus, elec-

- trically-heated tools and instruments. Areas known to have documents related to colloid systems or wetting agents include: subclasses 324+ for steam or vapor generator which is a fluid-in-circuit type heater, subclasses 386+ for heating device for use in converting a substance from a solid or liquid to a gaseous state (especially subclasses 394+ for evaporation device for substance which is a liquid (e.g., water, etc.)).
- 401, Coating Implements With Material Supply. Areas known to have documents related to colloid systems or wetting agents include: subclass 190 for device including pressurized reservoir (e.g., aerosol device).
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, for the diverse subject matter provided for in that class. Areas known to have documents related to colloid systems or wetting agents include: subclasses 41+ for processes of storage of liquid which may involve use of a colloid system such as an emulsion or foam spread on the surface of the liquid.
- 423, Chemistry of Inorganic Compounds, areas known to have documents related to colloid systems or wetting agents include: subclasses 445+ for products or processes of making same wherein the product is free carbon in substantially pure form, such as, diamond, fullerenes.
- 424, Drug, Bio-Affecting and Body Treating Compositions, appropriate subclasses, for diverse subject matter provided for in that class; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed or solely disclosed as specifically intended for such use. With respect to Class 516, Class 424 will take its provided for subject matter when it is claimed or is solely disclosed. Areas known to have documents related to colloid systems or wetting agents include: subclass 1.13 for radionuclide containing composition containing aerosol, subclass 1.25 for radionuclide containing composition which dissolves or elutes from solid or gel matrix, subclass 1.29 for radionuclide containing composition containing coated, impregnated, or colloid-sized particulate, subclasses 40+ for combustible or chemically reactive compositions to produce a smoke, mist, or aerosol, subclasses 43+ for effervescent or pressurized fluid containing composition, subclass 70.19 for compositions which have topical nontherapeutic utility for
- treating the hair or scalp of the living body (e.g. grooming or adorning aids, tonics, rinses) which contain two or more surfactants (i.e. compounds that lower the surface or interfacial tension, including detergents, foaming or wetting agents, emulsifiers, solubilizers, or dispersants) which are either designated in the claims or are art recognized as such, subclasses 76.2+ for non-body deodorizing substances which are evaporable, sublimable, or gas (e.g., deodorization of air, aerosol spray compositions, gels), subclasses 278.1+ for a claimed particular emulsifier for a nonspecific immunoeffector, subclass 455 for a capsule which contains an emulsion, dispersion, or solution, subclasses 469+ in which sustained or differential release type tablets, lozenges, or pills contain discrete soluble particles of the active ingredient are positioned or dispersed in a solid, generally insoluble matrix from which said particles are leached sequentially under conditions of use from the outside portions of the matrix inwardly, digest 1 for aerosol hair preparations.
- 425, Plastic Article or Earthenware Shaping or Treating: Apparatus, for specified apparatus for shaping materials; see the class definition for full appreciation of the scope of this class. Of relevance to colloid technology is the provision for apparatus for shaping of molten materials (including metal, but excluding glass), where no molding surface is employed, e.g., by melt comminution or spheroidizing, particularly subclasses 6+ for apparatus comprising means dividing or comminuting liquid material to form discrete particles and allowing the liquid to solidify while in particulate form.
- 426, Food or Edible Material: Processes, Compositions, and Products, appropriate subclasses, for food products, compositions, and processes of treating same, including for processes of forming food materials in colloid suspensions and emulsions and the products or compositions produced thereby; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. Areas known to have documents related to colloid systems or wetting agents include: subclass 116 for packaged or wrapped product having utility for dispensing or serving an aerosol, subclass 235 for application of a gas, mist, smoke, or vapor to a food material under the influence of electrical or wave energy, subclass

- 329 wherein a food foam is protected against deterioration, or wherein a food is protected against undesirable foam formation by contact with a change inhibiting chemical agent other than an antioxygen agent, subclasses 531+ for per se products or processes of preparing or treating compositions involving chemical reaction by addition, combining diverse food material, or permanent additive (particularly subclasses 564+ for foam or foamable type, subclasses 573+ for gels or gellable composition, subclasses 602+ for an aqueous emulsion in a composition having fat or oil basic ingredient other than butter in emulsion form, subclass 654 for stabilizing or preserving agent or emulsifier other than organophosphatide), subclass 519 for processes including mixing or agitating, e.g., homogenizing.
- 427, Coating Processes, for coating or impregnating processes in general and see the Class 427 definition for the general line between Class 427 and the composition classes. Areas known to have documents related to colloid systems or wetting agents include: subclasses 245+ for forming a foraminous product having a microporous coating (particularly subclass 246 for such by coagulating or jelling the coating), subclasses 248.1+ for coating by vapor, gas, or smoke, subclasses 421+ for spraying.
- 428, Stock Material or Miscellaneous Articles, main class definition, section VI, B, for the distinction between a composition and a stock material. Areas known to have documents related to colloid systems or wetting agents include: subclasses 158+ for a structurally defined web or sheet which includes variation in thickness and is composed of foamed or cellular layer (e.g., polyurethane, rubber), subclasses 304.4+ for web or sheet containing a structurally defined element or component and two or more components at least one of which has voids (e.g., porous, cellular, microvoids).
- 429, Chemistry: Electrical Current Producing Apparatus, Product and Process, for devices which produce an electrical current by means of a chemical reaction or change in physical state (e.g., from liquid to gas, etc.); and also included are the following subject matter not provided for elsewhere, A. Structural combinations of the device, subcombinations and elements thereof, B. Electrolyte, compositions of the same, and process of preparation, C. Process of operating the device, and D. Miscellaneous process involving the device. Areas known to have documents related to colloid systems or wetting agents include: subclass 250 for apparatus having separator, retainer, spacer or materials for use for producing an electrical current in combination with a wetting agent or surfactant.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, appropriate subclasses for class provided for compositions and processes; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. Areas known to have documents related to colloid systems or wetting agents include: subclass 113 for image developing composition or product which is a multiple phase liquid carrier medium, such as an emulsion, for electric or magnetic imagery, subclasses 199+ for films used for image forming and transfer (e.g., instant photography) which may include an emulsion or a gel, subclasses 377+ for emulsifier in a coupling compound with silver compound sensitizer in a process of color imaging using a radiation sensitive composition, subclass 404 where a gel or web is used in a developer for nonradiation sensitive image processing, subclass 493 for surfactant or emulsifier processing additive in a developer for nonradiation sensitive image processing compositions or process of making, subclasses 495.1+ for film which may contain an emulsion or a gel (e.g., gelatin).
- 435, Chemistry: Molecular Biology and Microbiology, for processes of making chemical compounds which involve micro-organisms or enzymes, other processes relating to cell, organ, or tissue growth or maintenance, compositions for use in such processes, in vitro processes of testing or measuring, certain apparatus for class provided for processes. Nominal recitation of a Class 435 process (e.g., fermentation or fermentation step) combined with a process otherwise classifiable in Class 516 is proper for Class 516, while recitation of a significant Class 435 step combined with a step or COMPOSITION otherwise classifiable in Class 516 is proper for Class 435 with a discretionary cross-reference to Class 516. Areas known to have documents related to colloid systems or wetting agents include: subclass 246 for foam culture of micro-organisms, subclasses 262+ for processes in which preexisting material or compound, which may include a

- hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), subclasses 283.1+ for class apparatus (particularly 301.1 for apparatus including means for breaking foams), cross-reference art collection 812 for collection of art of Class 435 relating to foam control, foreign art collection FOR184 for a method of using genetically engineered (other than hybrid or fused ) cells for oil spill cleanup.
- 436, Chemistry: Analytical and Immunological Testing, for (A) processes which involve a chemical reaction for determining qualitatively or quantitatively the presence of a chemical element, compound, or complex in a composition or a chemical compound, or an element or radical in a compound; (B) processes for analysis which involve an in vitro antigen-antibody, immunological or protein binding interaction other than those involving a living antigen, or enzyme label; (C) processes of analysis or study of the chemical properties of a sample; the physiological effect of a sample; or chemical determination of a physical property of a sample; (D) compositions and their mere methods of use of thermoparticulating compositions; (E) chemical test standards for A, B, and C; (F) analytical compositions for A, B or C (subject to the caveat of III A of the Class 436 definition); (G) combinations of tests or measurements with methods of regulating a chemical reaction not otherwise provided for in a chemical synthesis class or otherwise. Areas known to have documents related to colloid systems or wetting agents include: subclass 18 for compositions, such as anticoagulant containing, which are used to mimic or quantify the effect, in a chemical test procedure, of another chemical composition, or to stabilize, preserve or otherwise prepare a sample for a chemical test and the processes of use of such materials preparatory to a chemical test procedure, subclass 515 for tests involving diffusion or migration of antigen or antibody through a gel, such as immunoelectrophoresis.
- 446, Amusement Devices: Toys. This class is a specific class under the generic Class 472, Amusement Devices, and includes patents relating to devices of the type whose principal purpose is for the amusement or recreation of children, wherein there is some physical interaction between a person and the device. Areas known to have documents related to colloid systems or wetting agents include: subclasses 15+ for bubble producing toys, subclasses 24+ for smoke producing toys.
- 454, Ventilation, for apparatus and processes for supplying air to and removing it from enclosures, for distributing and circulating the air therein, or for preventing its contamination. Areas known to have documents related to colloid systems or wetting agents include: cross-reference art collection 901, for fog dispeller, i.e., comprising means for eliminating or dispersing cloud-like, condensed water vapor which is positioned close to a ground surface.
- 501, Compositions: Ceramic, for compositions comprising glass, ceramic, clay, porcelain, brick, or refractory; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. See that class definition for the statement of the relationship between Class 501 and other composition classes. Areas known to have documents related to colloid systems or wetting agents include: subclass 12 for glass or glass forming compositions which are made by a gel route, subclass 39 for glass or glass forming compositions which are pore forming, subclasses 80+ for pore-forming ceramic compositions other than glass or glass forming compositions.
- 502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, appropriate subclasses for (1) a mixture of materials intended to catalyze a reaction or to sorb a component of a fluid or (2) certain single materials specifically structured to catalyze a reaction or sorb a component; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. Areas known to have documents

- related to colloid systems or wetting agents include: subclasses 233+ for forming a catalyst or precursor comprising forming silica gel (i.e., an amorphous form of hydrate silica, generally produced by precipitation or coagulation of a silica sol or decomposition of a silicate), subclass 405 for solid sorbent comprising inorganic gel composition, in which there is usually a metal or silicon oxide in relatively minor amount which is distributed in suspension in water, appearing to be solid while the water constitutes as much as 95 to 99% of the mixture, subclasses 416+ for sorbent compositions which are free carbon containing (the term "activated carbon" will be construed as indicating a composition comprising carbon and unidentified components, functioning as a sorbent for this class).
- 504, Plant Protecting and Regulating Compositions, appropriate subclasses for a plant stimulating or eradicating composition; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. In this class the chemical structure of the ingredient disclosed as having a utility set forth in the class Definition is used as the primary basis of classification, therefore colloid systems and wetting agents are not specifically or separately provided for, but such subject matter will be found throughout the subclasses.
- 505, Superconductor Technology: Apparatus, Material, Process, for subject matter involving (a) superconductor technology above 30 K and (b) art collections involving superconductor technology; including apparatus, devices, materials, and processes involving such technology. Areas known to have documents related to colloid systems or wetting agents include: subclass 165 for system, device, or component utilizing suspension of superconducting particulate material in liquid (e.g., seal, pump, etc.), subclass 440 for processes under the Class definition of producing or treating high temperature ( $T_c > 30$  K) superconductor material or superconductor containing products or processes of producing or treating precursors thereof which utilizes a sol or gel at any stage, cross-reference art collection 735 for a process limited to the methods of making or treating high temperature ( $T_c > 30$  K) superconducting shaped material, article, or device which includes a sol-gel process.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, appropriate subclasses for (1) compositions of matter for use in earth boring, well treating, or preventing contaminant deposits in petroleum oil conduits having or not having structure, physical form, or heterogeneous arrangement of components, (2) processes of making, or processes peculiar to making such compositions and for which there is no provision elsewhere, and (3) mere methods of use of said compositions or of a compound in earth boring, well treating, or in preventing contaminant deposits in petroleum oil conduits; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use. Areas known to have documents related to colloid systems or wetting agents include: subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, antiflocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents (especially subclass 102 for compositions which may contain foam), subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents (especially subclass 202 for compositions which may contain foam), cross-reference art collection 921 for well treating composition intended to break an emulsion or gel or to uncrosslink a polymer, cross-reference art collection 922+ for fracture fluids which may be gels.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed, (1) compositions of matter which are solid antifriction devices or articles described in terms of their chemical composition, (2) materials from which said solid antifriction devices or articles are fashioned, (3) compositions which serve as lubricants or separants for moving solid surfaces, (4) compositions of mineral oils admixed with non-hydrocarbon materials and not limited to a function or utility provided for elsewhere in any other art-class\* ; including colloid sys-



tems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed or solely disclosed as specifically intended for such use. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic. Many patents are known to disclose lubricant compositions which are emulsion colloid systems. See subclasses 113+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain elemental carbon, coal or graphite, subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated.

- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed (1) cleaning compositions for cleaning or removing foreign matter from solid surfaces, (2) auxiliary compositions for perfecting the cleaning compositions (e.g., rinse or dryer added fabric softener compositions), (3) compositions of this class defined in terms of specific structure, (4) packages of compositions of this class, and (5) processes of preparing compositions of this class, in each case where not provided for elsewhere; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed or solely disclosed as specifically intended for such use. A claim which does not specify a cleaning use is termed a "generic use claim" which claim creates a requirement for a mandatory search and cross-reference in Class 516 even if presented with claims reciting cleaning or in a disclosure which solely discloses cleaning use. Class 510 is hierarchically organized as follows: based upon the substrate or specific contaminant to be cleaned, then by functional additive component, then by physical characteristic, then by specific organic component, then last placement is auxiliary compositions. Although various subclasses specifically pro-

vide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to colloid systems or wetting agents include: subclasses 112+ for compositions for cleaning contact lenses (especially subclass 113 for compositions including solid particulate component which may be a colloid system (suspension)), subclass 117 for composition for cleaning removable dentures which is gas generating (e.g., effervescent), subclass 120 for composition for cleaning human scalp hair, scalp, or wig which is dispensed by release of pressurized gas, subclasses 130+ for composition for cleaning human skin (especially subclass 135 for high-foaming bath (e.g., bubble bath), subclass 139 for particulate containing which may be colloid-sized, subclass 140 for packaged in an aerosol dispenser, subclass 158 for cream, paste, or gel), subclass 198 for gas-propelled composition for removing heat-degraded food residue from solid surface, subclass 216 for compositions facilitating sweeping uncarpeted floors by reducing the amount of dust that becomes airborne, subclasses 221+ for liquid, paste, or gel composition used in automatic dishwasher, subclass 242 for liquid composition (e.g., emulsion) for removing foreign matter from surface carrying a protective or ornamental coating, finish, or adhesively attached covering (e.g., from painted or papered wall, automobile body), subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclass 279 for gas-propelled composition (e.g., aerosol) for cleaning pile fabric or upholstery (e.g., carpet, rug), subclass 280 for gel or liquid composition for cleaning pile fabric or upholstery (e.g., carpet, rug), subclass 317 for suds regulating component and peroxy component containing, subclass 336 for gel, cream, or paste, subclasses 337+ for liquid compositions (e.g., slurry) which may be colloid systems), subclass 364 for compositions for displacing organic liquid film from a solid surface which may include a wetting agent, subclass 365 for compositions for removing greasy or oily contaminant from a substrate which may include a wetting agent, subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclasses 368+ for

- with scrubbing or scouring component (e.g., abrasive, slurry), subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)), subclasses 383+ for liquid, paste, or gel cleaning composition with halogen, nitrogen, oxygen, or phosphorus containing antiseptic or biocidal component, subclasses 395+ for cleaning composition with a scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), subclass 403 for gel or malleable (e.g., plastic-like) cleaning composition, subclass 404 for cream or paste cleaning composition, subclasses 405+ for liquid cleaning compositions, especially for chemically specified surfactants (particularly subclass 406 for gas-propelled, subclass 417 for plural immiscible liquid phases (e.g., emulsion, oily and aqueous layers), subclass 418 for liquid and solid phases (e.g., suspension, slurry)), subclass 514 for dishwasher rinse composition which may be a wetting agent, subclasses 535 for surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).
- 512, Perfume Compositions, for compositions including an organoleptic ingredient which imparts aroma, processes of extracting essential oils for use in perfumes from animal or plant sources, and processes of utilizing a compound or composition as a perfume, which may be intended for application to a living body, clothing, or objects, (e.g., a flower fragrance may be applied to a person, a pine scent to a Christmas tree, etc.) This class is substantially organized based upon the chemical constituents of the composition; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic. Areas known to have documents related to colloid systems or wetting agents include: subclass 2 for compositions which include a chemical compound whose sole purpose is to prevent chemical change, or to extend the life of the perfume by retarding evaporation of the perfume active ingredient, subclass 4 for nonliquid or encapsulated compositions, such as gels containing a perfume material
- 514, Drug, Bio-Affecting and Body Treating Compositions, which incorporates all the definitions and rules as to subject matter of the class of which it is an integral part. Areas known to have documents related to colloid systems or wetting agents include: subclasses 772+ for compositions which contain a designated non-bioactive organic compound (e.g., emulsifying polymers, gelatin), cross-reference art collections 936-975 which pertain to specifically disclosed carrier systems, physical form, or specified nonbioactive ingredient (particularly cross-reference art collections 937+ for subject matter involving a composition in the form of a dispersion or emulsion, cross-reference art collection 944 for subject matter involving a gel form and containing specified ingredients to give a gel, cross-reference art collection 945 for subject matter involving a foam and containing specified ingredients to form said foam, cross-reference art collection 946+ for subject matter involving the increasing or enhancing of the rate or amount of active ingredient absorbed into the treated subject (e.g., skin, digestive tract), cross-reference art collection 957 for subject matter involving application or distribution of an active ingredient using a vapor or gas, cross-reference art collection 958 for subject matter involving a combination of an active ingredient with a carrier system which allows administration by smoking or inhaling, cross-reference art collection 959 for subject matter involving inhalation of a breathing gas such as oxygen containing gas and supplements thereto).
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses in the 520 series of Classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.
- 521, Synthetic Resins or Natural Rubbers Part of the Class 520 Series, for (1) ion-exchange polymers, (2) processes of reclaiming a synthetic resin, and (3) cellular synthetic resins.

- Areas known to have documents related to colloid systems or wetting agents include: subclass 28 for a mixture of a synthetic ion exchange resin which may be in gel form, subclasses 50+ for cellular products or processes of preparing a cellular product (e.g., foams, pores, channels), subclasses 53+ for the gel of a porous synthetic resin.
- 522, Synthetic Resins or Natural Rubbers -- Part Of The Class 520 Series, for processes of preparing or treating a solid polymer utilizing wave energy and for compositions which contain a photosensitizer and which when reacted form a product proper for this class. Areas known to have documents related to colloid systems or wetting agents include: subclass 3 for processes of forming or modifying a solid polymer wherein wave energy is employed and wherein specified mixing, stirring, agitating, movement of material or directional orientation is employed; or compositions therefore.
- 523, Synthetic Resins or Natural Rubbers -- Part Of The Class 520 Series, for synthetic resins or specified intermediate condensation products admixed with a nonreactant material. Areas known to have documents related to colloid systems or wetting agents include: subclasses 100 through 181 for nonporous synthetic polymeric materials with specified functions or uses and for intentional composition, or process of preparing same, of specifically provided for special use, application, or property (particularly subclass 171 for composition having opalescent, pearlescent, or variegated color, subclass 175 for liquid-solid drag reduction composition).
- 524, Synthetic Resins or Natural Rubbers -- Part Of The Class 520 Series, for synthetic resins or specified intermediate condensation products admixed with a nonreactant material. Areas known to have documents related to colloid systems or wetting agents include: subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof, subclass 801 for process of preparing water-in-oil emulsion or dispersion, or product thereof, cross-reference art collection 903 for aerosol compositions, cross-reference art collection 916 for hydrogel compositions, cross-reference art collection 922 for flocculating, clarifying, or fining compositions, cross-reference art collection 923 for subject matter involving treating or preparing nonaqueous dispersions or emulsions of solid polymer or SICP.
- 528, Synthetic Resins or Natural Rubbers -- Part Of The Class 520 Series, for polymers derived from at least one nonethylenic reactant, and also for processes of treating a polymer either derived from ethylenic or nonethylenic reactants wherein chemical bonds in the polymer are left unaffected. Areas known to have documents related to colloid systems or wetting agents include: cross-reference art collections 934+ for subject matter relating to recovery and physical processing of natural rubber latex (particularly cross-reference art collection 936 for coagulating).
- 530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, appropriate subclasses for colloid systems such as gel-like proteins; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically comprising such constituency. Areas known to have documents related to colloid systems or wetting agents include: subclasses 200+ for natural resin derivatives which are not pure compounds, and processes of treating natural resins or derivatives (e.g., wood, gum, and tall oil rosin; wood or pine tar or pitch; shellac; copals from various sources, both recent and fossil, such as Congo, Manila, etc.; amber; dammar; kauri; coal resin; gum accroides; sandarac; cativo resin), subclasses 354+ for gelatin, subclass 356 for collagen, subclasses 360+ for casein or caseinate, subclasses 362+ for albumin, subclasses 370+ for plant or yeast proteins, subclasses 380+ for blood proteins (particularly 381+ for blood coagulation factors and fibrin, e.g., thromboplastin).
- 585, Chemistry of Hydrocarbon Compounds, for hydrocarbon in pure or relatively pure state and for certain compositions containing hydrocarbons, and methods for making such compounds and compositions by synthesis, blending or otherwise, and certain methods for treating. Class 516 is superior to Class 585 for purposes of placement of original reference (OR).
- 604, Surgery, which incorporates all the definitions and rules as to subject matter of the class of which it is an integral part, for methods of treatment of the living body and apparatus used

in the inspection and treatment of diseases, wounds, and other abnormal conditions of the bodies of humans and lower animals. Areas known to have documents related to colloid systems or wetting agents include: subclass 368 for methods and apparatus comprising portable receptor or material collecting means used to receive material discharge from the body and treatment of the body by employing material collectors or receptors which comprise an absorbent pad for external or internal application and supports therefor (e.g., catamenial devices, diapers, etc.) and which contain collagen or gelling material.

## SECTION V - GLOSSARY

NOTE: Words and terms identified with an asterisk (\*) are defined in this section of this class definition.

### ABIETIC ACID

C 19H 29COOH. Contains a hydrogenated phenanthrene ring system. See also rosin\*.

### ADJUVANT

A material\* which assists the action of another material\*, especially an agent\*.

### AEROGEL

A dispersion\* of a gas in a liquid or solid. A common example is silica-gel which is a light fluffy silica particle having a porous amorphous matrix. Cf. aerosol\*.

### AEROSOL

A colloid system of a discontinuous solid or a liquid phase (dispersand\*) in a gas or vapor continuous phase (dispersant\*). See smoke\* and fog\*.

### AGENT

Refers to the effective material\*, energy, or means which acts in the given context. A colloid system making or stabilizing agent acts to form or stabilize a colloid system; usually characterized by its tendency to collect at the interface between two immiscible phases and not to be confused with the material which constitutes the continuous or discontinuous phases, particularly noting that gas propellants for aerosols and foams are NOT colloid system making agents. A colloid system breaking,

resolving, or inhibiting agent acts to dissipate the interface between two immiscible phases. The term agent also includes subcombinations of an agent composition, such as adjuvants\*. (Thus, the term agent may apply to a compound or composition which may not be fully functional for its stated context, or its functionality may be greatly enhanced by another component which is not present.) Note that although a compound can be an agent, this class does not provide for compounds, per se. An agent may be physical or energy.

### AGGREGATION

See flocculation\*.

### ALCOSOL

A colloid system of a dispersand\* (discontinuous phase), in a liquid alcohol dispersant\* (continuous phase). Examples are metal oxides such as silica or rare earth oxides dispersed in lower and higher liquid alcohols. See sol\*.

### AQUASOL

See hydrosol\*.

### BICONTINUOUS EMULSION

Type of emulsion wherein the aqueous or polar phase and the oily or non-polar phases are characterized as both being continuous. Commonly associated with emulsion polymerization.

### BLEEDING

See syneresis.

### BLOWN FATTY ACID

Fatty acid treated to oxidize, commonly by passing (blowing) air, oxygen, ozonized air, or ozone through the material under mildly elevated temperatures. The process forms ketones from hydroxy groups and hydroxy groups at unsaturation sites. Process conditions also control the degree of polymerization and esterification reactions.

### BLOWN OIL

Oil treated to oxidize, commonly by passing (blowing) air, oxygen, ozonized air, or ozone through the material under mildly elevated temperatures. The process forms

ketones from hydroxy groups and hydroxy groups at unsaturation sites.

#### BREAKER, COLLOID SYSTEM; BREAKING, COLLOID SYSTEM

The effective material\*, energy, or means used for accomplishing the act of breaking or resolving (i.e., destroying) a colloid system, such as agent\* compositions specialized and designed for or peculiar to use in colloid system breaking. See emulsion breaker.

#### CARBAMATE

A compound based on carbamic acid,  $\text{NH}_2\text{COOH}$ , in the form of its salts and derivatives.

#### CARBOHYDRATE; CARBOHYDRATE-DERIVATIVE

Carbohydrates are compounds which are saccharides whose monomeric units are polyhydroxy mono-aldehydes or polyhydroxy mono-ketones, having the formula  $\text{C}_n(\text{H}_2\text{O})_n$ , where  $n$  is five or six, or the corresponding cyclic hemiacetals thereof. Carbohydrate-derivatives maintain the carbon skeleton and the carbonyl function or hemi-acetal function of the saccharide. See section LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, subsection Glossary References, for additional information concerning this definition.

#### CARBOXYL GROUP

Structure comprised of a carbonyl group ( $\text{C}=\text{O}$ ) with a hydroxyl group ( $\text{OH}$ ) attached to the carbonyl carbon.

#### COAGULATE

The product of coagulation; the irreversible combination of semisolid particles (e.g., fats, proteins, oils) to form a mass. Often brought about by the addition of a coagulant. See flocculate.

#### COALESCENCE

The phenomenon of the merging of two or more drops of liquid (e.g., oil or water droplets in emulsions) or particles (e.g., solid particles in sols\* and dispersions\*) resulting in a larger drop or particle having a lower interfacial surface area and a generally less stable condition.

#### COLLOID SYSTEM

Also called colloid dispersions\* or colloid suspensions. Sometimes simply colloid, but this is not preferred because this may also be used to refer to colloid-sized particles, per se. A colloid system is a multi-phase combination of matter in which one or more constituents has one or more dimensions below about five microns, however systems having particles of 20 to 50 microns have been described. Nobel prize winning research chemist, Wolfgang Ostwald (1853-1932), reportedly said "There are not sharp differences between mechanical suspensions, colloidal solutions, and molecular solutions. There is a gradual and continuous transition from the first through the second to the third." With respect to particles in suspension, in colloid systems the particles are governed by surface forces and therefore act as individual flow units, as contrasted to non-colloid mixtures which are governed by gravity or body (e.g. drag) forces. Macromolecules may form either true solutions or colloid systems and categorization properly depends upon the properties relevant to the intended use. Foams are colloid systems because they contain two phases and the liquid film has a thickness which is colloid-sized. Most common colloid systems are composed of particles of a colloid-sized dispersed phase (the subdivided or discontinuous phase) surrounded by a continuous phase. See also sol\*.

#### COLOPHONY

See Rosin\*.

#### COMPOUND

See LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, above.

#### DETERGENT

A compound and/or composition characterized by the ability to remove unwanted materials from a solid surface by physicochemical means, i.e., emulsifying, dispersing, suspending, dissolving, etc.

#### DIATOMACEOUS EARTH

Diatomite, Kieselguhr. Siliceous material composed of the skeletal remains of small, prehistoric organisms (diatoms). About 88% silica.

#### DILATANT; DILATANCY

The property of a material wherein when subjected to shear the rate of increase of strain decreases with

increasing shear. Examples are pastry doughs and highly concentrated solid colloid-sized particle suspensions.

#### DISPERSAND

The suspended colloid-sized particles in a dispersant\*. Often referred to as the discontinuous phase.

#### DISPERSANT

The dispersing medium or continuous phase.

#### DISPEROID

The suspended particles in a dispersion.

#### DISPERSION

A suspension of particles in a solid, liquid, or gas to form a biphasic or polyphasic composition. Colloid-sized particles form colloid dispersions. See also colloid system.

#### DRYING OIL

A liquid fat which readily absorbs oxygen from air, polymerizes, becomes resinous, and which can thereby form a hard film. The property of drying is due to the presence of unsaturation in the hydrocarbon length of fatty acid oil, usually the glycerides of linoleic\* and linolenic\* acids. Common sources include linseed, tung, perilla, soybean, fish and dehydrated castor oils. Drying oils have high iodine number; nondrying oils, low.

#### EMULSION

A colloid system of two or more immiscible liquid phases. Examples are water-in-oil (w/o), oil-in-water (o/w), water-in-oil-in-water (w/o/w). Also includes immiscible oils/solvents.

#### EMULSION BREAKER

The effective material\*, energy, or means used for accomplishing the act of destroying an emulsion colloid system, such as agent\* compositions specialized and designed for or peculiar to use in emulsion breaking.

#### EMULSIFYING AGENT

The effective material\*, energy, or means used for accomplishing the act of making an emulsion colloid

system, such as agent\* compositions specialized and designed for or peculiar to use in emulsion making. Typically, this is a surfactant added to aid in the emulsification of two immiscible liquids. Characteristically resides at the interface in a stable emulsion.

#### ESSENTIAL OIL

Volatile component of plants which imparts the characteristic odor to flowers, leaves, stems, or twigs, or wood, or derivable from plant constituents. Various methods are used to derive including distillation, pressing, solvent extraction, and fat extraction. Distinguished from fatty oils by usually being terpenes\*, fairly volatile, non-greasy, and non-saponifiable (except those with esters). Most essential oils are mixtures, an exception being oil of wintergreen which is essentially pure methyl salicylate.

#### FAT

Naturally occurring glycerides. Natural fats are the natural oils which are solid at room temperature.

#### FATTY ACID

Organic\* compounds comprising a hydrocarbon chain with a carboxylic acid at one end. The term usually implies an unbroken hydrocarbon chain of seven or more carbon atoms. Saturated, unsaturated, and polyunsaturated occur naturally. The most common fatty acids in natural fats or oils are palmitic, stearic, oleic, lauric, and myristic.

#### FLOCCULATE; FLOCCULATING AGENT\* FLOCCULANT

Flocculate is the aggregation or combination of suspended colloid-sized particles to form small clumps or short clusters of elongated strands. Flocculating agent\* is the effective material\*, energy, or means used for accomplishing the act of flocculating an colloid system, such as agent\* compositions specialized and designed for or peculiar to use in flocculation. Typical flocculating agents\*: alum, ferric chloride, lime and polyelectrolytic polymer such as polyacrylamide. See coagulate\*.

#### FOAM

A colloid system characterized as a gas suspended in a liquid; wherein the gas is the dispersand\* (discontinuous) phase and the liquid is the dispersant\* (continuous) phase.

**FOG**

A colloid system characterized as a suspension of colloid-sized liquid droplets in a gas; wherein the liquid is the dispersand\* (discontinuous) phase and the gas is the dispersant\* (continuous) phase. See aerosol\*.

**FUME**

Particles of solids or liquids suspended in a gas, e.g., smoke from combustion. Also the vapors evolved from concentrated sulfuric or nitric acids, or from solvents.

**FUMED SILICA**

The colloid-sized form of silica formed by the vapor phase hydrolysis of silanes or halosilanes in a Hydrogen-oxygen flame. Generally characterized by high purity, amorphous crystallinity, and colloid-sized particle.

**GEL**

A solid or semisolid colloid system formed of a continuous or semicontinuous solid phase and a liquid phase (either discontinuous or continuous or mixed), often identified by its outward gelatinous appearance, and which exhibits properties of a solid such as plasticity, elasticity, or rigidity. Gels are typically characterized by a physical property of the system, such as the yield point (defined as the shearing force required to result in the flow of said gel), which is a measure of the gel strength. A variety of compositions can form gels, including but not limited to; solubilized polymers, cross-linked polymers, concentrated surfactant solutions having crystalline-like properties (e.g., liquid crystal phases), organically modified and unmodified hydrous metal oxides (e.g., silica, silicates, alumina, iron, etc.), and organically modified and unmodified hydrous mixed metal oxides (e.g., clays, bentonites, synthetic aluminosilicates). See Thixotropic\*.

**GLYCERIDE**

An ester of glycerol and fatty acid(s) in which one or more of the hydroxyl groups of the glycerol have been replaced by any combination of acid radicals. Monoglyceride has one fatty acid ester, diglyceride two, and triglyceride has three. Naturally occurring fats and oils are mainly triglycerides of fatty acids, most commonly are palmitic, stearic, and oleic.

**GLYCEROL**

1,2,3-propanetriol.

**GREEN ACIDS**

The oil insoluble sulfonic acid products of sulfonation of petroleum\*. Also called sludge acids. C.f. mahogany\* acids.

**HLB**

Hydrophile Lipophile Balance. The most commonly used HLB system was developed by W.C. Griffin (1949). The system employs certain empirical formulas to calculate the HLB number between 0 and 20; high numbers correspond to hydrophilic surfactants with high water solubility and functionally good solubilizing agents\*, detergents, and o/w stabilizers; low numbers correspond to hydrophobic (or lipophilic) surfactants with low water solubility, which solubilize water into oils and stabilize w/o emulsions.

**HYDROSOL**

A colloid system of a dispersand\* (discontinuous phase), in an aqueous liquid dispersant\* (continuous phase). Examples are metal oxides such as silica or rare earth oxides dispersed in an aqueous phase. See sol\*.

**INORGANIC COMPOUND**

Any compound that is not organic\*.

**LEVELING AGENT\***

Term of the textile industry referring to a wetting agent\* used to aid in the uniform dispersal of a dye in a dye bath and generally have wetting properties.

**LINOLEIC ACID**

A diunsaturated fatty acid, the glyceride of which is present in drying oils such as linseed oil.  $\text{CH}_3(\text{CH}_2)4\text{CH}=\text{CHCH}_2\text{CH}=\text{CH}(\text{CH}_2)7\text{COOH}$ .

**LINOLENIC ACID**

A triunsaturated fatty acid, the glyceride of which is present in drying oils such as linseed oil.  $\text{CH}_3\text{CH}_2\text{CH}=\text{CHCH}_2\text{CH}=\text{CHCH}_2\text{CH}=\text{CH}(\text{CH}_2)7\text{COOH}$ .

**MAHOGANY ACIDS; MAHOGANY SOAP**

The oil soluble sulfonic acid products of sulfonation of

petroleum oils. Cf. green\* acids. Mahogany soaps are the saponified acids.

## MATERIAL

Material is given its broadest meaning and includes mixtures (petroleum, alloys, cement, etc.) and substances\*.

## MER

The part of a monomer which is present in the reaction product of a reaction involving what is commonly referred to as a monomer (e.g., dimer, trimer, tetramer, oligomer).

## MINERAL-OIL

Included by this term are (1) materials exploited from the Earth which are liquid, primarily petroleum oil or relatively crude fractions thereof, which are primarily mixtures of hydrocarbons, (2) liquid or semi-solid derivatives of solid materials exploited from the Earth, including asphalts (from petroleum, shale, or sand sources), tars (including coal tar), pitches, or waxes, which are primarily mixtures of hydrocarbons, (3) materials which are Fischer-Tropsch crudes, that is, the liquid hydrocarbonaceous mixture resulting from the hydrogenation of a carbon oxide, (4) wood tars or wood tar oils, which are similar to coal tar in that they include an unidentified mixture including hydrocarbons. Note: excluded are (1) substantially purified hydrocarbon compounds, (2) solid carbonaceous materials such as coal, lignite, or peat (as distinguished from semi-solid petroleum-derived asphalts or asphalt derived from shales or sands). See section LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, subsection Glossary References, for additional information concerning this definition.

## MULTIPLE (PHASE) EMULSION

Emulsion having more liquid phases than one discontinuous and one continuous phase. Types are water-in-oil-in-water (w/o/w), oil-in-water-in-oil o/w/o, water-in-oil-in-water-in-oil (w/o/w/o), etc. See emulsion.

## O/W

Oil-in-water emulsion. Cf. w/o, w/o/w.

## OIL

(1) Naturally occurring oils are glycerides\*. Natural

fats are the natural oils which are solid at room temperature. (2) Mineral-oils\* are exploited from the earth, or derived from processing woody materials, generally comprising hydrocarbons. See definition, hereinabove, of mineral-oil used for this Class.

## OLEIC ACID; OLEATE

$\text{CH}_3(\text{CH}_2)_7\text{CH}:\text{CH}(\text{CH}_2)_7\text{COOH}$ . Mono-unsaturated fatty acid found in most natural fats and oils. Glycerol monooleate is the monoglyceride formed from the esterification reaction between glycerol and oleic acid.

## ORGANIC; ORGANIC COMPOUND; ORGANIC GROUP

When the expression "organic" or "organic compound" or "organic group" is used in this class, it means a compound or group which meets the requirements wherein the molecule (or group) is characterized by two carbons bonded together, one atom of carbon bonded to at least one atom of hydrogen or halogen, or one atom of carbon bonded to at least one atom of nitrogen by a single or double bond; certain compounds are exceptions to this rule, i.e., HCN, CN-CN, HNCO, HNCS, cyanogen halides, cyanamide, fulminic acid, and metal carbides. Said exceptions and all other chemical compounds shall be regarded as inorganic\*. See section LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, subsection Glossary References, for additional information concerning this definition.

## ORGANO-(PREFIX)

The prefix organo indicates a requirement that the term meet the definition of organic\*, organic group \* or organic compound \*.

## ORGANOSOL

A colloid system of a dispersand\* (discontinuous phase) in an organic\* liquid dispersant\* (continuous phase). Examples are metal oxides such as silica or rare earth oxides dispersed in liquid alcohols, or in non-polar organic\* solvents. See sol\*; cf. hydrosol\*.

## PALMITIC ACID; PALMITATE

$\text{CH}_3(\text{CH}_2)_{14}\text{COOH}$ . Hexadecanoic acid, cetylic acid, palmic acid, ethalic acid. Saturated fatty acid found in most natural oils and fats. Glycerol monopalmitate is the monoglyceride formed from the esterification reaction between glycerol and palmitic acid.



**PETROLEUM, PETROLEUM OIL**

Crude oil. Mixture of hydrocarbons, with small amounts of compounds containing nitrogen, Phosphorus, Sulfur, and oxygen, obtained from underground deposits. Often the terms are applied to fractions derived from the basic yield, including distillation and cracking fractions.

**PEPTIDE; POLYPEPTIDE**

Compounds composed of amino acids bound together by amide linkages. Proteins are polypeptides.

**RED OIL**

Commercial grade of oleic acid containing about 15% each of linoleic and stearic acids.

**RESIN, SYNTHETIC**

Compound or mixtures of compounds produced from simpler compounds by polymerization or condensation reactions.

**RESIN, NATURAL**

A broad term covering a variety of naturally derived products usually obtained by secretion or disintegration (extraction). Vegetative sources are usually mixtures of carboxylic acids or their esters, essential\* oils (these are usually non-saponifiable, non-glyceride), and terpenes; mostly insoluble in water and soluble in alcohols, ethers, and carbon disulfide. Examples include balsam and rosin\* which are obtained from coniferous trees. Used in varnish, printing inks, and adhesives. Shellac resin is obtained from the secretion of an insect indigenous to India. Amber resin is a polymerized vegetative resin that occurs as a fossil. Amorphous sulfur is considered an inorganic natural resin. Cf. drying oil. See section **LINES WITH OTHER CLASSES AND WITHIN THIS CLASS**, subsection Glossary References, for additional information concerning this definition.

**RESINOID**

Thermosetting resin or resin like material which becomes solid and infusible upon heating. Linseed oil and other drying-oils\* and partially condensed phenol-formaldehyde are examples.

**RESOLVER**

See Breaker\*.

**ROSIN**

Colophony. Abietic-acid\* (80-90%) types and remnants from derivation. Usually designated according to its source, e.g., gum rosin (from exudate of incisions on living trees); wood rosin (from Southern pine stumps); and tall oil rosin (from by-products of the wood pulp industry). The principal constituents isolated from rosin are carboxylic acids with a hydrophenanthrene nucleus, comprising abietic acid and its isomers, such as pimaric acid. The acids may exist in rosin as acid anhydrides. The mixed acids are known in the trade as rosin acids or resin acids, the two expressions sometimes being used interchangeably. Gum rosin is obtained from the residue left after distillation of turpentine from the exudate from live trees. Wood rosin is obtained by extracting the wood or stumps with naphtha and removing the volatile portion. Tall oil rosin is obtained by fractionation of tall-oil\*. See section **LINES WITH OTHER CLASSES AND WITHIN THIS CLASS**, subsection Glossary References, for additional information concerning this definition.

**SMOKE**

A colloid system of a solid dispersand\* (discontinuous phase), in a gas dispersant\* (continuous phase), as an aerosol\*. Cf. fog\*.

**SOL**

Usually refers to a colloid system of a dispersand\* (gas, solid, or liquid discontinuous phase), in a liquid dispersant\* (continuous phase). However, aerosol\* refers to a colloid system of colloid-sized particles in a gas continuous phase. Sol may also refer to just the liquid phase of a colloid system. Examples are metal oxides such as silica or rare earth oxides dispersed in an aqueous phase (aquesols\*), or in liquid lower and higher alcohols (alcosols\*), or in organic solvents (organosols\*). Sol is generic to organosol\*, alcosol\*, aquesol\*, and hydrosol\*, where in each instance the prefix refers to the continuous phase.

**SORBITAN**

Cyclic ether tetrahydric alcohols derivable from sorbitol by removal of one molecule of water.

**SORBITAN FATTY ACID ESTERS**

Mixtures of partial esters of sorbitol and sorbitol anhydrides with fatty acids.

#### SORBITOL

$C_6H_8(OH)_6$ , 1,2,3,4,5,6-hexanehexol. Reduction product of glucose, found in nature in small quantities.

#### SPREADING AGENT\*

A material\*, energy, or means used for affecting the spreading and displacement of one material\* for another material\*. In a type of wetting known as spreading wetting, a first liquid in contact with a solid is displaced by a second liquid. See also wetting\* agents. See section LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, subsection Glossary References, for additional information concerning this definition.

#### STEARIC ACID; STEARATE

$CH_3(CH_2)_{16}COOH$ . The most common fatty acid in natural oils and fats. Glycerol monostearate is the monoglyceride formed from the esterification reaction between glycerol and stearic acid.

#### SUBSTANCE

A substance is a chemical compound or element. Substance is characterized as being homogeneous, particularly down to the molecular level. See The Condensed Chemical Dictionary, (tenth edition, 1981) Van Nostrand Reinhold Company Inc. CF. material\*. Note: this definition may not be followed in other Classes; often the term is used loosely as a synonym to material\*.

#### SULFOXY

A radical containing a Sulfur-oxygen double bond. Examples of sulfoxy containing compounds include; sulfate, sulfonate, and sulfone compounds.

#### SURFACE ACTIVE AGENT\*

A compound which reduces the surface tension of a liquid when dissolved therein or reduces the interfacial tension between two liquids. A surface active agent\* compound is typically characterized by at least one hydrophobic portion and at least one hydrophilic portion. Also referred to as surfactant.

#### SURFACE TENSION

The force exerted at an interface by the molecules below the interface. For example, in a gas-liquid interface, the surface tension is due to the high concentration of the liquid molecules relative to the lower concentration of the gas molecules. The strength depends on the characteristics of the liquid, and to a lesser extent, the gas.

#### SURFACTANT

See surface active agent\*.

#### SYNERESIS

The contraction of a gel\* composition on standing, accompanied by the exudation of liquid.

#### TALL OIL

A mixture of rosin\* acids (35-40%) and fatty acids (50-60%) and other remnants of derivation. Obtained from the spent black liquor (alkaline) of the pulping (digesting) process of pine wood (sulfate or kraft paper processes) by concentrating until the sodium salts of the various acids separate, followed by acidification (e.g., by sulfuric acid). See section LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, subsection Glossary References, for additional information concerning this definition.

#### TENSIDE

A term widely employed in Europe which means surface active agents\*.

#### TERPENE OILS

$C_{10}H_{16}$ . Unsaturated hydrocarbon based upon isoprene unit ( $C_5H_8$ ), acyclic or cyclic, with or without benzene moiety. Dipentene is monocyclic, pinene is dicyclic, and myrcene is acyclic. Being non-glyceride oils, they are not saponifiable. Examples include tall and pine oils. Cf. oil, essential oil, glyceride.

#### THIXOTROPIC

The property of materials, such as some gels\*, to liquefy when subjected to shear, such as by agitation or other mechanical energy and to return to gel\* upon rest. CF. dilatancy\*.

#### TSP

Tri-sodium Phosphate; sodium phosphate, tribasic; Na

3PO4 12H2O. Commodity product used alone or compounded with other materials\* for use in multitudes of applications including; water softening, boiler water treating, detergency, textile treating, laundering, industrial cleaning, dietary supplements, pH buffering, emulsifying.

#### TURKEY RED OIL

Sulfonated castor oil or soluble castor oil. Sulfonated fats or oils obtained by the treatment of a variety of hydroxylated or unsaturated natural fats and oils, usually castor oil, with sulfuric or chlorosulfonic acids, and washing. Also known as alizarin oil or alizarin assistant when used as a dyeing aid with alizarin dye(s).

#### TWITCHELL PROCESS

Splitting of fats to glycerol and fatty acids by acid hydrolysis, in the presence of steam and catalytic amount of Twitchell Reagent\*.

#### TWITCHELL REAGENT

Catalyst for the Twitchell-process\*. The sulfonation product of reacting sulfuric acid with oleic acid and naphthalene (naphthalenestearosulfonic acid).

#### W/O; W/O/W

Water-in-oil emulsion and water-in-oil-in-water emulsion. Cf. o/w.

#### WETTING AGENT\*

The effective material\*, energy, or means used for accomplishing the act of wetting a surface. Wetting most generally is the process of displacing from a surface (solid or liquid) one fluid, such as air, with another, such as water. See section LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, subsection Glossary References, for additional information concerning this definition.

#### ZEOLITE

A hydrated silicate of aluminum and sodium and/or calcium. Natural and synthetic. Typical:  $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 3x\text{SiO}_2 \cdot y\text{H}_2\text{O}$ .

#### SUBCLASSES

### 1. CONTINUOUS GAS OR VAPOR PHASE: COLLOID SYSTEMS; COMPOSITIONS

### CONTAINING AN AGENT FOR MAKING OR STABILIZING COLLOID SYSTEMS; PROCESSES OF MAKING OR STABILIZING COLLOID SYSTEMS; PROCESSES OF PREPARING THE COMPOSITIONS (E.G., SMOKE, FOG, AEROSOL, CLOUD, MIST):

This subclass is indented under the class definition. Subject matter which is a (1) colloid system having a continuous gas or vapor phase, (2) composition containing an agent\* for making or stabilizing such a system, (3) process of making or stabilizing such a system, or (4) process of preparing a composition containing an agent\* for making or stabilizing such a system; such as smoke, fog, aerosol, cloud, mist, aerosolizing.

- (1) Note. The discontinuous phase may be a solid, liquid, or a polyphasic material\*, such as gels, emulsions.
- (2) Note. As set forth in the class definition, included in this and indented subclasses are subcombination compositions, which includes those compositions which are substantially completely formulated except for performing a step thereon to form the colloid system, such as a chemical reaction, or a physical step. Examples of such step include spraying, aerosolizing, atomizing, heating, agitating, dissolving. Thus, a liquified composition in a pressurized container intended for creating a colloid-sized mist is proper for placement in this and indented subclasses, and as appropriate in other colloid system areas of this Class if the liquified composition is itself a colloid system.

#### SEE OR SEARCH THIS CLASS, SUBCLASS:

- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam), and propellant per se, therefor.
- 905+, for a collection of art under the class definition which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition con-

taining said agent\* and lacking both dispersant\* and dispersand\*.

SEE OR SEARCH CLASS:

- 40, Card, Picture, or Sign Exhibiting, subclass 213 for smoke producing apparatus and systems limited to sky-writing.
- 43, Fishing, Trapping, and Vermin Destroying, subclasses 124+ for process and apparatus the primary object of which is to destroy or kill vermin without trapping them (particularly see subclasses 125+ for apparatus for creating or involving fumes or smoke when such fumes are used for destroying vermin and not for general disinfecting or similar purposes, subclass 132.1 for devices or processes under subclass 124 for destroying invertebrate animals, i.e., insects), cross-reference art collection 900 for apparatus for dispersing i.e., spraying, a liquid mass or jet of droplets used to destroy insects.
- 47, Plant Husbandry, subclass 2 for methods and devices for preventing the freezing of trees and plants and their fruit not elsewhere provided for (such as misting).
- 73, Measuring and Testing, subclasses 28.01+ for measuring solid content of gas (e.g., particle).
- 102, Ammunition and Explosives, subclass 334 for apparatus for and methods of smoke generating (i.e., causing vapor, cloud, etc., to be formed by a burning), subclasses 335+ for pyrotechnics apparatus and corresponding methods designed to produce smoke, light, heat, and/or noise (e.g., fireworks display, amusement, flash photo, signal), subclasses 367+ for apparatus for or methods of using an explosion to cause a liquid, solid, or gas to be scattered or spread about in the form of a mist, vapor, particles, or gas (e.g., noxious or incapacitating, plant, insect, animal, foliage, biological warfare/chemical warfare).
- 109, Safes, Bank Protection, or a Related Device, subclasses 29+ for devices of the Class combined with means for releasing, generating and/or distribut-

ing gas, smoke, vapors and/or liquids either manually, automatically upon attack, or automatically in case of fire, which fluent material is normally, but not necessarily, toxic, noncombustible, or incapacitating and may normally, but not necessarily, be used to repel attacks and/or put out, prevent, or impede the action of a fire, and this includes devices relating to jails, where the purposes of this subclass are also present.

- 126, Stoves and Furnaces, subclass 59.5 for portable devices for generating heat or smoke for protecting orchards from frost (e.g., smudge pots).
- 141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclass 3 for processes in which an aerosol type dispenser type receiver is filled by steps involving manipulation of the dispenser as an incident to or aid to refilling or filling the supply chamber (i.e., the material to be dispensed, powder or liquid, is dissolved in or carried by a vaporizing propellant which forms the charge of the dispenser).
- 148, Metal Treatment, appropriate subclasses for compositions employed in the treatment of solid metal such as for soldering, fluxing, heat treating, tempering, or otherwise modifying solid metal.
- 149, Explosive and Thermic Compositions or Charges, appropriate subclasses for explosive and thermic compositions and methods of preparing or treating such compositions, where the latter are used to produce usable heat or flame or by-products resulting from the use of such compositions (e.g. smoke flares). See various subclasses based on active composition for explosive or thermic compositions which may be gels or pastes or may be intended to yield smoke as result of combustion (particularly subclasses 29+, 37+, and 78+), subclasses 17+ for compositions containing particulate material dispersed substantially entirely within a solidified or matrix medium and which are characterized by dispersed phase within a continu-

- ous phase, subclass 108.4 for smoke affecting composition (e.g., coloring), subclass 108.8 for compositions containing a stability or viscosity agent (e.g., gelling, thickening, thinning, liquefying, etc., agent, a stabilizer or unstabilizer (activator), a burning rate modifier), cross-reference art collection 110+ for compositions or processes reciting or disclosing a reference to a particular size or dimension of the particles of at least one of the ingredients or the size or dimension of all or part of the composition in particulate form, cross-reference art collection 117 for smoke generating or weather modifying composition with a resin, and cross-reference art collection 118 for composition containing a resin dissolved in the continuous phase of a gel.
- 162, Paper Making and Fiber Liberation; see subclasses 63+ for processes wherein the fibrous material is forcibly and directly contacted with a (reactive or nonreactive) gas, vapor, or mist during digestion or chemical treatment for some purpose other than drying.
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclass 74 for the reproduction or formation of powder, flakes, or colloid-sized particles by electrodeposition in which the deposit does not remain with the base upon which deposition is made and compositions therefor.
- 222, Dispensing, subclasses 394+ for dispensers in which the material is caused to discharge from the container by fluids under pressure that directly contact the material to be dispensed, subclass 635 for pressurized aerosol container.
- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 1+ for processes (particularly see subclass 2.1+ for processes including spraying or dispersing and intended for weather control or modification including fog clearing or making, snow making, rain making (i.e., either (a) to wet a surface or (b) to precipitate moisture from the atmosphere), subclasses 8+ for processes of mixing a gas with the material to be dispersed), and subclasses 14.1+ for apparatus for weather control, such as snow making.
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252.
- 261, Gas and Liquid Contact Apparatus, subclasses 75+ for devices specially adapted to produce an intimate contact between gases and liquids (especially 78.1+ for atomizer).
- 264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 5+ for processes of forming solid particulate material directly from a molten or liquid mass, e.g., liquid comminuting to form particles.
- 392, Electric Resistance Heating Devices, subclasses 324+ for steam or vapor generator which is a fluid-in-circuit type heater, subclasses 386+ for heating device for use in converting a substance from a solid or liquid to a gaseous state (especially subclasses 394+ for evaporation device for substance which is a liquid (e.g., water, etc.)).
- 401, Coating Implements With Material Supply, subclass 190 for device including pressurized reservoir (e.g., aerosol device).
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclass 1.13 for radionuclide containing composition containing aerosol, subclasses 40+ for combustible or chemically reactive compositions to produce a smoke, mist, or aerosol, subclasses 43+ for effervescent or pressurized fluid containing composition, subclasses 76.2+ for non-body deodorizing substances which are evaporable, sublimable or gas (e.g., deodorization of air, aerosol

- spray compositions, gels), digest 1 for aerosol hair preparations.
- 426, Food or Edible Material: Processes, Compositions, and Products, subclass 116 for packaged or wrapped product having utility for dispensing or serving an aerosol, subclass 235 for application of a gas, mist, smoke, or vapor to a food material under the influence of electrical or wave energy.
- 427, Coating Processes, subclasses 248.1+ for coating by vapor, gas, or smoke, and subclasses 421+ for spraying.
- 435, Chemistry: Molecular Biology and Microbiology, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam subclasses 283.1+ for class apparatus.
- 446, Amusement Devices: Toys, subclasses 24+ for smoke producing toys.
- 514, Drug, Bio-Affecting and Body Treating Compositions, cross-reference art collection 957 for subject matter involving application or distribution of an active ingredient using a vapor or gas, cross-reference art collection 958 for subject matter involving a combination of an active ingredient with a carrier system which allows administration by smoking or inhaling, cross-reference art collection 959 for subject matter involving inhalation of a breathing gas such as oxygen containing gas and supplements thereto.
- 524, Synthetic Resin or Natural Rubbers--Part of the Class 520 Series, cross-reference art collection 903 for aerosol compositions of synthetic resins or natural rubbers.

**2. Discontinuous phase formed by combustion or oxidation/reduction reaction (e.g., smudge-pot smoke):**

This subclass is indented under subclass 1. Subject matter in which the discontinuous phase contains material formed by a combustion reaction or an oxidation/reduction reaction.

**SEE OR SEARCH THIS CLASS, SUB-CLASS:**

- 4, for discontinuous phase formed by a hydrolysis step, such as metal oxide from metal chloride/water reaction.
- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam), and propellant per se, therefor.

**SEE OR SEARCH CLASS:**

- 43, Fishing, Trapping, and Vermin Destroying, subclasses 124+ for process and apparatus the primary object of which is to destroy or kill vermin without trapping them (particularly see subclasses 125+ for apparatus for creating or involving fumes or smoke when such fumes are used for destroying vermin and not for general disinfecting or similar purposes, subclass 132.1 for devices or processes under subclass 124 for destroying invertebrate animals, i.e., insects), cross-reference art collection 900 for apparatus for dispersing i.e., spraying, a liquid mass or jet of droplets used to destroy insects.
- 102, Ammunition and Explosives, subclass 334 for apparatus for and methods of smoke generating (i.e., causing vapor, cloud, etc., to be formed by a burning), subclasses 335+ for pyrotechnics apparatus and corresponding methods designed to produce smoke, light, heat, and/or noise (e.g., fireworks display, amusement, flash photo, signal), subclasses 367+ for apparatus for or methods of using an explosion to cause a liquid, solid, or gas to be scattered or spread about in the form of a mist, vapor, particles, or gas (e.g., noxious or incapacitating, plant, insect, animal, foliage, biological warfare/chemical warfare).
- 126, Stoves and Furnaces, subclass 59.5 for portable devices for generating heat or smoke for protecting orchards from frost (e.g., smudge pots).
- 149, Explosive and Thermic Compositions or Charges, appropriate subclasses for explosive and thermic compositions and methods of preparing or treating

such compositions, where the latter are used to produce usable heat or flame or by-products resulting from the use of such compositions (e.g. smoke flares). See various subclasses based on active composition for explosive or thermic compositions which may be gels or pastes or may be intended to yield smoke as result of combustion (particularly subclasses 29+, 37+, and 78+), subclasses 17+ for compositions containing particulate material dispersed substantially entirely within a solidified or matrix medium and which are characterized by dispersed phase within a continuous phase, subclass 108.4 for smoke affecting composition (e.g., coloring), subclass 108.8 for compositions containing a stability or viscosity agent (e.g., gelling, thickening, thinning, liquefying, etc., agent, a stabilizer or unstabilizer (activator), a burning rate modifier), cross-reference art collection 110+ for compositions or processes reciting or disclosing a reference to a particular size or dimension of the particles of at least one of the ingredients or the size or dimension of all or part of the composition in particulate form, cross-reference art collection 117 for smoke generating or weather modifying composition with a resin, and cross-reference art collection 118 for composition containing a resin dissolved in the continuous phase of a gel.

424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 40+ for combustible or chemically reactive compositions to produce a smoke, mist, or aerosol.

### 3. **Steam present:**

This subclass is indented under subclass 2. Subject matter in which the colloid system contains steam.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam), and propellant per se, therefor.

### 4. **Discontinuous phase formed by hydrolysis step (e.g., metal oxide from metal chloride/water reaction):**

This subclass is indented under subclass 1. Subject matter in which the discontinuous phase contains material\* is formed by a hydrolysis step, such as, metal oxide from metal chloride/water reaction.

(1) Note. The hydrolysis step must be disclosed and reasonably proximate to the class subject matter and not just speculation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam), and propellant, per se, therefor.

SEE OR SEARCH CLASS:

424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 40+ for combustible or chemically reactive compositions to produce a smoke, mist, or aerosol.

### 5. **Steam present:**

This subclass is indented under subclass 1. Subject matter in which the colloid system contains steam.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam), and propellant per se, therefor.

SEE OR SEARCH CLASS:

162, Paper Making and Fiber Liberation; see subclass 68 for processes wherein the fibrous material is forcibly and directly contacted with steam only during digestion or chemical treatment for some purpose other than drying.

392, Electric Resistance Heating Devices, subclasses 324+ for steam or vapor generator which is a fluid-in-circuit type heater, and subclasses 386+ for a heating device for use in converting a

substance from a solid or liquid to a gaseous state (especially subclasses 394+ for evaporation device for substance which is a liquid (e.g., water, etc.)).

**6. Discontinuous phase primarily liquid (e.g., mist, fog):**

This subclass is indented under subclass 1. Subject matter in which the colloid system contains a discontinuous phase which is primarily liquid, such as, mist or fog.

- (1) Note. "Primarily liquid" means that 50% or more of that phase is liquid, by weight, volume, or molecule.
- (2) Note. Located in this subclass are colloid systems formed by compressed (but not liquified) or flowing gases, and not solid phase containing. Liquified propellants are located in indented primary classes.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 7, for a similar colloid systems which contain a solid phase, such as droplets of liquid surrounding a solid seed nucleus, solid walled microcapsules, smoke, or solid colloid-sized particles mixed with the liquid colloid-sized particles.
- 8, for a similar colloid systems formed by liquified, absorbed, absorbed, or dissolved propellant.
- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam), and propellant, per se, therefor.

**7. The discontinuous phase contains a solid phase (e.g., seed nucleus, microcapsules, smokey fog):**

This subclass is indented under subclass 6. Subject matter in which the primarily liquid discontinuous phase further contains solid phase material such as droplets of liquid surrounding a solid seed nucleus, solid walled microcapsules, smoke (solid colloid-sized particles) mixed with the liquid colloid-sized particles.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam), and propellant, per se, therefor.

**8. The continuous phase contains a propellant derived from nongaseous phase (e.g., liquified propellant, such as hydrocarbon, halogenated hydrocarbon, dimethylether; sorbed or dissolved CO 2):**

This subclass is indented under subclass 6. Subject matter in which the continuous phase contains a propellant of which a significant, intended portion was derived from a non-gaseous (solid, liquid, gel, or supercritical) phase, such as, liquified propellant, such as hydrocarbon, halogenated hydrocarbon, dimethylether; adsorbed or dissolved CO 2; propellant imbued in gel.

- (1) Note: Subject matter found here includes compositions (and nominally recited cans or containers) for making aerosols which are propelled from the container through a valve system by the pressure of the propellant expanding into the ambient atmosphere where the propellant is formulated to coexist with a non-gaseous phase of itself which tends to permit delivery of the aerosol at a substantially constant pressure until the container is empty. Also located here are the propellants per se when their ultimate intended use is disclosed or known to be for such aerosol compositions.
- (2) Note: The propellant must derived from the non-gaseous phase, not merely coexist with non-gaseous discontinuous phase component(s).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 6, for colloid systems derived from purely gaseous propellant.
- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam), and propellant, per se, therefor.



## SEE OR SEARCH CLASS:

- 141,   Fluent Material Handling, With Receiver or Receiver Coating Means, subclass 3 for processes in which an aerosol type dispenser type receiver is filled by steps involving manipulation of the dispenser as an incident to or aid to refilling or filling the supply chamber (i.e., the material to be dispensed, powder or liquid, is dissolved in or carried by a vaporizing propellant which forms the charge of the dispenser).
- 222,   Dispensing, subclasses 394+ for dispensers in which the material is caused to discharge from the container by fluids under pressure that directly contact the material to be dispensed, and subclass 635 for a pressurized aerosol container.
- 401,   Coating Implements With Material Supply, subclass 190 for a device including pressurized reservoir (e.g., aerosol device).
- 424,   Drug, Bio-Affecting and Body Treating Compositions, subclass 1.13 for a radionuclide containing composition containing aerosol, subclasses 43+ for an effervescent or pressurized fluid containing composition, subclasses 76.2+ for nonbody deodorizing substances which are evaporable, sublimable, or gas (e.g., deodorization of air, aerosol spray compositions, gels), and digest 1 for aerosol hair preparations.
- 426,   Food or Edible Material: Processes, Compositions, and Products, subclass 116 for a packaged or wrapped product having utility for dispensing or serving an aerosol, and subclass 235 for application of a gas, mist, smoke, or vapor to a food material under the influence of electrical or wave energy.
- 510,   Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed

based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to aerosol colloid systems include subclass 120 for a composition for cleaning human scalp hair, scalp, or wig which is dispensed by release of pressurized gas, subclasses 133+ for a composition for cleaning human skin (especially subclass 140 for packaged in an aerosol dispenser), subclass 198 for a gas-propelled composition for removing heat-degraded food residue from solid surface, subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclass 279 for gas-propelled composition (e.g., aerosol) for cleaning pile fabric or upholstery (e.g., carpet, rug)), subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition, or package)), subclasses 395+ for a cleaning composition with a scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), and subclasses 405+ for liquid cleaning compositions, especially for chemically specified surfactants (particularly subclass 406 for gas-propelled).

#### 8.1   Precursor contains plural immiscible liquid phases (e.g., emulsion):

This subclass is indented under subclass 8. Subject matter in which the precursor to the colloid system contains 2 or more immiscible liquid phases, such as, an emulsion or non-emulsified immiscible liquids.

- (1)   Note: The precursor refers to the colloid system and includes the propellant component(s) as well as the aerosol component(s).

#### SEE OR SEARCH THIS CLASS, SUBCLASS:

- 10+,   for colloid systems of continuous liquid phase and a discontinuous gas or

vapor phase (i.e., foam), and propellant per se, therefor.

**9. CONTINUOUS LIQUID OR SUPERCRITICAL PHASE: COLLOID SYSTEMS; COMPOSITIONS CONTAINING AN AGENT FOR MAKING OR STABILIZING COLLOID SYSTEMS; PROCESSES OF MAKING OR STABILIZING COLLOID SYSTEMS; PROCESSES OF PREPARING THE COMPOSITIONS (E.G., THICKENING AGENT; PROTECTIVE COLLOID AGENT; COMPOSITION CONTAINING AN EMULSIFYING AGENT WITH NO DISPERSANT\* DISCLOSED; ORGANIC LIQUID EMULSIFIED IN ANHYDROUS HF):**

This subclass is indented under the class definition. Subject matter which is a (1) colloid system having a continuous liquid or supercritical phase, (2) composition containing an agent\* for making or stabilizing such a system, such as thickening agent\* or other adjuvants, (3) process of making or stabilizing such a system, or (4) process of preparing a composition containing an agent\* for making or stabilizing such a system; such as, compositions containing an emulsifying agent\* or colloid system stabilizing agent\* with no dispersant\* disclosed, organic\* liquid emulsified in anhydrous HF; with the proviso that no continuous or semicontinuous solid phase is present (i.e. excludes paste, gel, floc, gelled emulsion, etc.).

- (1) Note. When the disclosure does not specify the continuous and the discontinuous phases sufficiently to place in an indented subclass, then the patent is placed in this subclass. However, some colloid systems have generic or subgeneric placements, such as a foam colloid system, which has a proper generic placement (i.e., all foam systems are provided for), or a primarily organic continuous liquid phase colloid system. When multiple genera are disclosed, each should be cross-referenced.
- (2) Note. Certain subject matter is proper for placement in this subclass, there being no indented subclass providing for such subject matter. An example is an organic\* liquid emulsified in anhydrous-HF (which is nonaqueous and nonor-

ganic\*). Another example is thickening agents for aqueous continuous phase systems in which the discontinuous phase has not been disclosed (therefor it could be organic liquid, solid, or bituminous). Continuous supercritical phase colloid systems are placed in this subclass.

- (3) Note. See this class definition, in Section II, LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, subsection C., Guidelines for OR (Original Reference) and XR (Cross Reference) Placement, hereinabove, for explanation of placement requirements for references. A generically claimed colloid system or making composition which is not provided for in the USPCS, requires an XR herein. Further, the placement of any generic claim must be premised on that generic disclosure rather than upon a specific use for which a classification is already made elsewhere (such as those classes which provide for solely disclosed subject matter). For example, a surfactant mixture solely disclosed as an aqueous phase laundry cleaning agent (which is inferred to define an oil-in-water system) and generically described as useful for surfactant uses or other such broad language which does not afford determination of or limitation to a specific continuous phase is placed in this subclass because no continuous phase is specified. If the broad language does specify the continuous and/or discontinuous phase so as to satisfy an indented subclass area, then and only then placement is made therein; multiple placements made be required in the case of generic and subgeneric type disclosures. In summation, users of this class schedule should locate all broadly defined liquid phase surfactants in this subclass if the continuous phase is generic.
- (4) Note. As set forth in the class definition, included in this and indented subclasses are subcombination compositions, which includes those compositions which are substantially completely formulated except for performing a step thereon to

form the colloid system, such as a chemical reaction, or a physical step. Examples of such step include depressurizing, heating, agitating, dissolving. Thus, a mixture intended to be agitated into an emulsion or a foam is proper for placement in this and indented subclasses.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase, i.e., foam.
- 20, for oil-in-oil emulsions, and other discontinuous organic\* liquid phase dispersed in continuous organic\* liquid phase.
- 21+, for emulsions in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* liquid, such as water-in-oil emulsions.
- 31+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* (e.g., suspensions or dispersions).
- 32, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily elemental carbon, such as graphite or diamond dispersed or suspended in oil or other primarily organic\* continuous liquid phase.
- 38+, for colloid systems (e.g., emulsions, suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily bituminous, coal, or carbon.
- 53+, for colloid systems (e.g., emulsions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily organic\* liquid.
- 77+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily non-bituminous solid.
- 98+, for gel or gelled emulsions (e.g., paste, gel, floc, gelled emulsion).

- 901, for a collection of art related to colloid systems of substantially pure carbon, such as graphite, diamond, carbon black, lamp black, Fullerenes.
- 902, for an art collection under the class definition which discloses gelled emulsions.
- 905+, for a collection of art under the Class definition which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition containing said agent\* and lacking both dispersant\* and dispersand\*.

**SEE OR SEARCH CLASS:**

- 60, Power Plants, subclass 39.464 for a reaction motor having means to produce combustion products wherein the fuel may be a solid, slurry, emulsion, dispersion, or suspension.
- 62, Refrigeration, subclass 54.1 for a process or apparatus for storing a cryogen as a mixture of diverse phases, such as, a gel or colloid suspension.
- 71, Chemistry: Fertilizers, subclass 64.08 for processes directed to the preparation of fertilizers in form of slurry or suspension, and the produced plant fertilizing compositions.
- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which are not elsewhere classified. See subclasses 162.1+ for coating or plastic composition containing a carbohydrate\* or carbohydrate-derivative\* which may be an emulsion (e.g., cellulose ether or ester), subclass 271 for dispersions of paraffin wax in water which contain more than just the material necessary to produce or stabilize the dispersion, subclass 277 for bituminous emulsions which contain more than just those components necessary to form or stabilize the emulsion, subclass 278 for bituminous dispersions which contain more than just those components necessary to form or stabilize the emulsion, and subclass 646 for inorganic settable

- composition containing protein which sets or hardens when mixed with water or aqueous solutions, usually forming a hard, stone-like product, and forming foam, cellular, hollow, or porous material.
- 134, Cleaning and Liquid Contact With Solids, for an apparatus for or processes of cleaning, which may include use of detergents, or for contacting solids with liquids for any purpose not provided for in another class.
- 137, Fluid Handling, subclass 13 for processes in which flow of fluent material is facilitated by the addition of material which affects the flow characteristics of the fluent material (e.g., suspending agent, viscosity reducing agent), or by the application of heat or other forms of energy.
- 138, Pipes and Tubular Conduits, subclasses 40+ for some devices disclosed for the purpose of forming a mixture or emulsion of a plurality of fluids but in which the claims are limited to the structure of the conduit and the flow restrictor.
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclasses 334+ for processes or compositions for the preparation of chemical compounds or of elements by means of electrolytic action (especially subclass 352 for processes wherein an emulsion, dispersion, or suspension is utilized as the electrolyte or bath, subclass 353 for processes wherein an electrolyte system having two or more separate, immiscible layers are utilized), and subclass 699 for electrolytic erosion of a workpiece for shape or surface change (e.g., etching, polishing, etc.) (process and electrolyte composition) wherein the electrolyte is held into contact with a portion of the workpiece surface by surface tension or capillary action.
- 209, Classifying, Separating, and Assorting Solids, subclass 5 for methods or apparatus for treatment of materials or items prior to their separation to facilitate the latter in which certain components of a mixture may be deflocculated or dispersed relatively to others or by which certain components may be flocculated (this subclass receives only methods and apparatus in which the deflocculation or coagulation is contributory to a subsequent separation of some components from others).
- 210, Liquid Purification or Separation, subclasses 634+ for liquid/liquid solvent or colloid dispersion extraction.
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252. See subclasses 71+ for compositions for thickening liquids for use as hydraulic fluids.
- 366, Agitating, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, cross-reference art collection 605 for mixing apparatus for stirring of paint. Processes which form colloid systems, such as emulsifying or foaming, are proper for compositions Classes for the claimed specified use compositions, and for Class 516 for nonspecified use compositions (generic).
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 41+ for processes of storage of liquid which may involve use of a colloid system such as an emulsion or foam spread on the surface of the liquid.
- 426, Food or Edible Material: Processes, Compositions, and Products, subclasses 531+ for per se products or processes of preparing or treating compositions involving chemical reaction by addition, combining diverse food material, or permanent additive (particularly subclasses 602+ for an aqueous emulsion in a composition having fat or oil basic ingredi-

- ent other than butter in emulsion form, subclass 654 for stabilizing or preserving agent or emulsifier other than organophosphatide), and subclass 519 for processes including mixing or agitating, e.g., homogenizing.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 113 for image developing composition or product which is a multiple phase liquid carrier medium, such as an emulsion, for electric or magnetic imagery, subclasses 377+ for emulsifier in a coupling compound with silver compound sensitizer in a process of color imaging using a radiation sensitive composition, and subclass 493 for surfactant or emulsifier processing additive in a developer for nonradiation sensitive image processing compositions or process of making.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, antiflocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents (especially subclass 102 for compositions which may contain foam), and subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents (especially subclass 202 for compositions which may contain foam).
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants which may be colloid systems. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.
- 514, Drug, Bio-Affecting and Body Treating Compositions, subclasses 772+ for compositions which contain a designated nonbioactive organic compound (e.g., emulsifying polymers, gelatin), cross-reference art collections 936-975 which pertain to specifically disclosed carrier systems, physical form, or specified nonbioactive ingredient (particularly cross-reference art collections 937+ for subject matter involving a composition in the form of a dispersion or emulsion, cross-reference art collection 945 for subject matter involving a foam and containing specified ingredients to form said foam).
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses in the 520 series of classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.
- 523, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclass 171 for nonporous synthetic polymeric compositions having opalescent, pearlescent, or variegated color.
- 524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous disper-

sion, latex, suspension, or emulsion therewith, or product thereof.

**10. Having discontinuous gas or vapor phase, i.e., foam:**

This subclass is indented under subclass 9. Subject matter in which the colloid system contains a liquid continuous phase and a discontinuous gas or vapor phase (i.e., foam).

- (1) Note. Solid foams are not provided for in this class, unless otherwise provided for as in the case of the foam of a gel system.
- (2) Note. Surfactant mixtures useful for making solid foams, e.g., polyurethane foams, and other formulations leading up to the uncured foam, are proper for this class and are classified in this and indented subclasses based upon the colloid system they are ultimately intended to make, i.e., the liquid (pre-cured) foam, even though it is a temporary intermediate.
- (3) Note. As set forth in the class definition, included in this and indented subclasses are subcombination compositions, which includes those compositions which are substantially completely formulated except for performing a step thereon to form the colloid system, such as a chemical reaction, alone or facilitated by a physical step. Examples of such step include spraying, heating, agitating, dissolving. Thus, a liquified composition in a pressurized container intended for creating a foam is proper for placement in this and indented subclasses, and as appropriate in other colloid system areas of this Class if the liquified composition is itself a colloid system. Also included are the propellants per se when the ultimate intended use is disclosed for these colloid systems.
- (4) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate at the boundary between the gas phase and the liquid phase to facilitate or assist

in the persistence of the system for the degree of time sufficient for its intended use.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 1+, for colloid systems of colloid-sized particles dispersed in continuous gas or vapor phase (e.g., smoke, fog, aerosol, cloud, mist), and the propellant per se, therefor.
- 9, for colloid systems based on continuous liquid phase (e.g., emulsions, suspensions, or dispersions) in which it is unknown whether the continuous liquid phase is aqueous or organic\*.
- 20, for oil-in-oil emulsions, and other discontinuous organic\* liquid phase dispersed in continuous organic\* liquid phase.
- 21+, for emulsions in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* liquid, such as water-in-oil emulsions.
- 31+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* (e.g., suspensions or dispersions).
- 32, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily elemental carbon, such as graphite or diamond dispersed or suspended in oil or other primarily organic\* continuous liquid phase.
- 38+, for colloid systems (e.g., emulsions, suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily bituminous, coal, or carbon.
- 53+, for colloid systems (e.g., emulsions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily organic\* liquid.
- 77+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily non-bituminous solid.

- 98+, for gel or gelled emulsion (e.g., paste, gel, floc, gelled emulsion).
- 901, for a collection of art related to colloid systems of substantially pure carbon, such as graphite, diamond, carbon black, lamp black, Fullerenes.
- 905+, for a collection of art under the Class Definition which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition containing said agent\* and lacking both dispersant\* and dispersand\*.

SEE OR SEARCH CLASS:

- 8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, appropriate subclasses for the special use compositions classified therein, and see subclass 477 for foam dye compositions.
- 71, Chemistry: Fertilizers, appropriate subclasses for plant fertilizing compositions, and see cross-reference art collection 900 for foams of plant fertilizing compositions.
- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which are not elsewhere classified. See subclass 646 for inorganic settable composition containing protein which sets or hardens when mixed with water or aqueous solutions, usually forming a hard, stone-like product, and forming foam, cellular, hollow, or porous material.
- 109, Safes, Bank Protection, or a Related Device, subclasses 29+ for devices of the class combined with means for releasing, generating and/or distributing gas, smoke, vapors and/or liquids either manually, automatically upon attack, or automatically in case of fire, which fluent material is normally, but not necessarily, toxic, noncombustible, or incapacitating and may normally, but not necessarily, be used to repel attacks and/or put out, prevent, or impede the action of a fire, and this includes devices relating to jails,

where the purposes of this subclass are also present.

- 156, Adhesive Bonding and Miscellaneous Chemical Manufacture; see the Class 156 definition for presentation of the diverse content of this class. See subclass 78 for processes of bonding of lamina which include the step of forming pores by introducing a gas under pressure to the interior of at least one lamina or by generating a gas in-situ within such lamina.
- 166, Wells, subclasses 244.1+ for processes of treating or operating a well (especially subclass 309 for processes which produce foam or gas in a well by a foaming or gas producing material in a well), which includes significantly claimed process steps of well treating or well operation. See also the notes and SEARCH CLASS references in Class 166 subclass 244.1.
- 169, Fire Extinguishers, see subclass 44 for processes involving the mixing of fire extinguishing components.
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclass 699 for electrolytic erosion of a workpiece for shape or surface change (e.g., etching, polishing, etc.) (process and electrolyte composition) wherein the electrolyte is held into contact with a portion of the workpiece surface by surface tension or capillary action.
- 209, Classifying, Separating, and Assorting Solids, subclass 5 for methods or apparatus for treatment of materials or items prior to their separation to facilitate the latter in which certain components of a mixture may be deflocculated or dispersed relatively to others or by which certain components may be flocculated (this subclass receives only methods and apparatus in which the deflocculation or coagulation is contributory to a subsequent separation of some components from others), subclasses 163+ for methods and means wherein some material is caused to adhere selectively (i.e., to some constituents and not to others) which so lightens the

- material constituents to which it is attached as to cause them to float on the liquid, while the other constituents are not floated (e.g. bubbles are caused to attach to some components of a material or mixture of solid materials and not to others, the components to which the bubbles are attached being caused thereby to float on the surface of the liquid).
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252. See subclass 3, 6.5, 8.05 for fire extinguishing foams, subclasses 8.57, 8.61+, 8.81+, and 8.91+ for various specialized compositions for leather, fur, or textile treating, subclass 61 for froth flotation compositions used in physical separation, subclasses 182.11+ for compositions containing a single reactant or plural reactants specialized or designed for use in subsequent reactions with other materials, but not with each other (e.g., for producing foams).
- 261, Gas and Liquid Contact Apparatus, see subclasses 75+ for devices specially adapted to produce an intimate contact between gases and liquids, digest 26 foam apparatus.
- 366, Agitating, subclasses 101+ for apparatus which includes agitation and injection of gas which may be a foam, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 279+ for apparatus with rotatable stirrer which may be used for making lather or foam, and cross-reference art collection 604 for mixing apparatus for making foam or lather. Processes which form colloid systems, such as emulsifying or foaming, are proper for compositions classes for the claimed specified use compositions, and for Class 516 for non-specified use compositions (generic).
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 41+ for processes of storage of liquid which may involve use of a colloid system such as an emulsion or foam spread on the surface of the liquid.
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 43+ for effervescent or pressurized fluid containing composition, subclass 70.19 for compositions which have topical nontherapeutic utility for treating the hair or scalp of the living body (e.g. grooming or adorning aids, tonics, rinses) which contain two or more surfactants (i.e. compounds that lower the surface or interfacial tension, including detergents, foaming or wetting agents, emulsifiers, solubilizers, or dispersants) which are either designated in the claims or are art recognized as such.
- 426, Food or Edible Material: Processes, Compositions, and Products, subclass 329 wherein a food foam is protected against deterioration, or wherein a food is protected against undesirable foam formation by contact with a change inhibiting chemical agent other than an antioxygen agent, subclasses 531+ for per se products or processes of preparing or treating compositions involving chemical reaction by addition, combining diverse food material, or permanent additive (particularly subclasses 564+ for foam or foamable type), subclass 519 for processes including mixing or agitating, e.g., homogenizing.
- 428, Stock Material or Miscellaneous Articles, subclasses 158+ for a structurally defined web or sheet which includes variation in thickness and is composed of foamed or cellular layer (e.g., polyurethane, rubber), subclasses 304.4+ for web or sheet containing a structurally defined element or component and two or more components at least one of which has voids (e.g., porous, cellular, microvoids).



- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.
- 446, Amusement Devices: Toys, subclasses 15+ for bubble producing toys.
- 501, Compositions: Ceramic, subclass 39 for glass or glass forming compositions which are pore forming, subclasses 80+ for other (non-glass or -glass forming) compositions which are pore-forming ceramic compositions.
- 504, Plant Protecting and Regulating Compositions, appropriate subclasses for a plant stimulating or eradicating composition; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 102 for earth boring compositions which may contain foam, subclass 202 for well treating compositions which may contain foam.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to foam colloid systems: subclass 117 for composition for cleaning removable dentures which is gas generating (e.g., effervescent), subclasses 133+ for composition for cleaning human skin (especially subclass 135 for high-foaming bath (e.g., bubble bath)), subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclass 317 for suds regulating component and peroxy component containing), subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)).
- 514, Drug, Bio-Affecting and Body Treating Compositions, cross-reference art collection 945 for subject matter involving a foam and containing specified ingredients to form said foam.
- 521, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclasses 50+ for cellular products or processes of preparing a cellular product, e.g., foams, pores, channels, such as solid foams.
- 11. With particulate solid:**  
This subclass is indented under subclass 10. Subject matter in which the colloid system contains a particulate solid.
- (1) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate at the boundary between the gas phase

and the liquid phase to facilitate or assist in the persistence of the system for the degree of time sufficient for its intended use.

**SEE OR SEARCH CLASS:**

73, Measuring and Testing, subclasses  
53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclass 60.11 for determining cleaning or foaming ability).

**12. The agent contains organic compound containing halogen:**

This subclass is indented under subclass 10. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains halogen. d (1)d ( ) Note. Halogen may be ionic or covalent or complex. d (2)d ( ) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate at the boundary between the gas phase and the liquid phase to facilitate or assist in the persistence of the system for the degree of time sufficient for its intended use. This subclass is not the proper location for foam colloid systems in which the only halogen containing compound is the propellant and/or gas phase.

- (1) Note. Halogen may be ionic or covalent or complex.
- (2) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate at the boundary between the gas phase and the liquid phase to facilitate or assist in the persistence of the system for the degree of time sufficient for its intended use. This subclass is not the proper location for foam colloid systems in which the only halogen containing compound is the propellant and/or gas phase.

**13. The agent contains organic compound containing phosphorus or silicon:**

This subclass is indented under subclass 10. Subject matter in which the colloid system making or stabilizing agent\* contains an

organic\* compound which contains silicon or Phosphorus.

- (1) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate at the boundary between the gas phase and the liquid phase to facilitate or assist in the persistence of the system for the degree of time sufficient for its intended use.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 23, for a similar silicon containing colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 24, for a similar phosphorus containing colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 38, for a similar silicon containing subject matter (unless provided by an indented subclass of specifically provided for organic\* compounds) used in bituminous-in-aqueous emulsions.
- 40, for a similar phosphorus containing colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 55, for a similar silicon containing colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase.
- 56+, for a similar phosphorus containing colloid system making or stabilizing

- agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 14. The agent contains organic compound containing sulfoxy\*:**  
This subclass is indented under subclass 10. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains sulfoxy\*.
- (1) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate at the boundary between the gas phase and the liquid phase to facilitate or assist in the persistence of the system for the degree of time sufficient for its intended use.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 25, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semisolid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 58+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous

continuous phase with discontinuous phase primarily (nonbituminous) solid.

**15. The agent contains organic compound containing nitrogen, except if present solely as NH 4+:**

This subclass is indented under subclass 10. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.
- (2) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate at the boundary between the gas phase and the liquid phase to facilitate or assist in the persistence of the system for the degree of time sufficient for its intended use.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent used in organic\* liquid continuous phase with discontinuous phase primarily solid or semisolid.
- 43+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.

- 67+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**16. The compound contains plural peptide linkages, i.e., compound formed from amino acids, natural or synthetic, by reaction of a carboxyl group of one such amino acid with an amino group of another same or different such amino acid:**

This subclass is indented under subclass 15. Subject matter in which the organic\* compound which contains nitrogen contains 2 or more peptide linkages, i.e., compound formed from natural or synthetic amino acids.

- (1) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate at the boundary between the gas phase and the liquid phase to facilitate or assist in the persistence of the system for the degree of time sufficient for its intended use.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 44, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.

- 70, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**SEE OR SEARCH CLASS:**

- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR 184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.

**17. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 15. Subject matter in which the organic\* compound which contains nitrogen contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

- (2) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate at the boundary between the gas phase and the liquid phase to facilitate or assist in the persistence of the system for the degree of time sufficient for its intended use.

**SEE OR SEARCH THIS CLASS, SUB-CLASS:**

- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 45, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 71, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**18. The agent contains organic compound containing oxygen:**

This subclass is indented under subclass 10. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains oxygen.

- (1) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate

at the boundary between the gas phase and the liquid phase to facilitate or assist in the persistence of the system for the degree of time sufficient for its intended use.

**SEE OR SEARCH THIS CLASS, SUB-CLASS:**

- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 46+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**19. The compound contains -C(=O)OH or salt thereof:**

This subclass is indented under subclass 18. Subject matter in which the organic\* compound contains the -C(=O)OH group or salt thereof.

- (1) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters

(-C(=O)OR where R is an organic\* group).

- (2) Note. When classifying foam colloid systems, the agent should not be confused with the gas phase. The (colloid system making or stabilizing) agent is the component which tends to aggregate at the boundary between the gas phase and the liquid phase to facilitate or assist in the persistence of the system for the degree of time sufficient for its intended use.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semisolid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 47+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**20. Primarily organic continuous liquid phase (e.g., organic liquid emulsified in an organic liquid):**

This subclass is indented under subclass 9. Subject matter in which the colloid system contains a primarily organic\* continuous liquid phase, such as organic\* liquid emulsified in an organic\* liquid.

- (1) Note. "Primarily organic\*" means that 50% or more of that liquid phase is organic\* material\*, by weight, volume, or molecule.
- (2) Note. Oil-in-oil colloid systems are proper for this subclass, there being no indented subclass providing for this subject matter.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 9, for colloid systems based on continuous liquid phase (e.g., emulsions, suspensions, or dispersions) in which it is unknown whether the continuous liquid phase is aqueous or organic\*.
- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase, i.e., foam.
- 21+, for emulsions in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* liquid, such as water-in-oil emulsions.
- 31+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* (e.g., suspensions or dispersions).
- 32, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily elemental carbon, such as graphite or diamond dispersed or suspended in oil or other primarily organic\* continuous liquid phase.
- 38+, for colloid systems (e.g., emulsions, suspensions, or dispersions) in which the continuous liquid phase is aqueous

- and the discontinuous phase is primarily bituminous, coal, or carbon.
- 53+, for colloid systems (e.g., emulsions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily organic\* liquid.
- 77+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily non-bituminous solid.
- 901, for a collection of art related to colloid systems of substantially pure carbon, such as graphite, diamond, carbon black, lamp black, fullerenes.
- 905+, for a collection of art under the class definition which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition containing said agent\* and lacking both dispersant\* and dispersand\*.

## SEE OR SEARCH CLASS:

- 60, Power Plants, subclass 39.464 for reaction motor having means to produce combustion products wherein the fuel may be a solid, slurry, emulsion, dispersion, or suspension.
- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 61.44+ for determining content or effect of a constituent of a mixture of plural liquids (e.g., multiphase liquid), subclasses 61.63+ for determining settling ability of sediment constituent of a liquid mixture, subclasses 71.71+ for determining content or effect of a solid component (e.g., particles) constituent of a liquid mixture, subclasses 64.41+ for a process or an apparatus for detecting or determining the composition of, a constituent of, or a property of a liquid or a liquid suspension of a solid and the determination is made by measuring or detecting the ability of the liquid to coagulate, to form a clot, or to form a stiffened or solid colloid-like mass (e.g., gel)).
- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which may be emulsions, dispersions, suspensions, which are not elsewhere classified.
- 138, Pipes and Tubular Conduits, subclasses 40+ for some devices disclosed for the purpose of forming a mixture or emulsion of a plurality of fluids but in which the claims are limited to the structure of the conduit and the flow restrictor.
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclasses 334+ for processes or compositions for the preparation of chemical compounds or of elements by means of electrolytic action (especially subclass 352 for processes wherein an emulsion, dispersion, or suspension is utilized as the electrolyte or bath, subclass 353 for processes wherein an electrolyte system having two or more separate, immiscible layers are utilized).
- 210, Liquid Purification or Separation, subclasses 634+ for liquid/liquid solvent or colloid dispersion extraction.
- 366, Agitating, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, cross-reference art collection 605 for mixing apparatus for stirring of paint. Processes which form colloid systems, such as emulsifying or foaming, are proper for compositions classes for the claimed specified use compositions, and for Class 516 for non-specified use compositions (generic).
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 41+ for processes of storage of liquid which may involve use of a colloid system such as an emulsion or foam spread on the surface of the liquid.

- 424, Drug, Bio-Affecting and Body Treating Compositions, subclass 455 for a capsule which contains an emulsion, dispersion, or solution, subclass 70.19 for compositions which have topical nontherapeutic utility for treating the hair or scalp of the living body (e.g. grooming or adorning aids, tonics, rinses) which contain two or more surfactants (i.e. compounds that lower the surface or interfacial tension, including detergents, foaming or wetting agents, emulsifiers, solubilizers, or dispersants) which are either designated in the claims or are art recognized as such, subclasses 278.1+ for a claimed particular emulsifier for a nonspecific immunoeffector.
- 426, Food or Edible Material: Processes, Compositions, and Products, subclasses 531+ for per se products or processes of preparing or treating compositions involving chemical reaction by addition, combining diverse food material, or permanent additive (particularly subclasses 602+ for an aqueous emulsion in a composition having fat or oil basic ingredient other than butter in emulsion form, subclass 654 for stabilizing or preserving agent or emulsifier other than organophosphatide), subclass 519 for processes including mixing or agitating, e.g., homogenizing.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 113 for image developing composition or product which is a multiple phase liquid carrier medium, such as an emulsion, for electric or magnetic imagery, subclasses 377+ for emulsifier in a coupling compound with silver compound sensitizer in a process of color imaging using a radiation sensitive composition, subclass 493 for surfactant or emulsifier processing additive in a developer for nonradiation sensitive image processing compositions or process of making.
- 504, Plant Protecting and Regulating Compositions, appropriate subclasses for a plant stimulating or eradicating composition; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be oil-in-oil emulsions. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to emulsion colloid systems include: subclasses 133+ for composition for cleaning human skin (especially subclass 158 for cream, paste, or gel), subclasses 221+ for liquid, paste, or gel composition used in automatic dishwasher, subclass 242 for liquid composition (e.g., emulsion) for removing foreign matter from surface carrying a protective or ornamental coating, finish, or adhesively attached covering (e.g., from painted or papered wall, automobile body), subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclass 280 for gel or liquid composition for cleaning pile fabric or upholstery (e.g., carpet, rug), subclass 336 for gel, cream, or paste, subclasses 337+ for liquid compositions (e.g., slurry) which may be colloid systems), subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)), subclasses 383+ for liquid, paste, or gel cleaning composition with halogen, nitrogen, oxygen, or phosphorus containing antiseptic or biocidal component, subclasses 395+ for cleaning composition with a



- scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), subclass 404 for cream or paste cleaning composition, subclasses 405+ for liquid cleaning compositions, especially for chemically specified surfactants (particularly subclass 417 for plural immiscible liquid phases (e.g., emulsion, oily and aqueous layers)), subclasses 535 for surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).
- 514, Drug, Bio-Affecting and Body Treating Compositions, subclasses 772+ for compositions which contain a designated nonbioactive organic compound (e.g., emulsifying polymers, gelatin), cross-reference art collections 936-975 which pertain to specifically disclosed carrier systems, physical form, or specified nonbioactive ingredient (particularly cross-reference art collections 937+ for subject matter involving a composition in the form of a dispersion or emulsion).
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses in the 520 series of classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.
- 524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof, cross-reference art collection 923 for subject matter involving treating or preparing nonaqueous dispersions or emulsions of solid polymer or SICP.
- 21. Discontinuous phase primarily inorganic liquid (e.g., water-in-oil emulsion, w/o):**  
This subclass is indented under subclass 20. Subject matter in which the colloid system contains a primarily organic\* continuous liquid phase with a discontinuous primarily inorganic\* liquid, such as water-in-oil emulsion.
- (1) Note. "Primarily inorganic\*" means that 50% or more of the discontinuous liquid phase is inorganic\*, by weight, volume, molecule, or atom.
- SEE OR SEARCH THIS CLASS, SUBCLASS:**
- 9, for colloid systems based on continuous liquid phase (e.g., emulsions, suspensions, or dispersions) in which it is unknown whether the continuous liquid phase is aqueous or organic\*.
- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase, i.e., foam.
- 20, for oil-in-oil emulsions, and other discontinuous organic\* liquid phase dispersed in continuous organic\* liquid phase.
- 31+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* (e.g., suspensions or dispersions).
- 32, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily elemental carbon, such as graphite or diamond dispersed or suspended in oil or other primarily organic\* continuous liquid phase.
- 38+, for colloid systems (e.g., emulsions, suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily bituminous, coal, or carbon.

- 53+, for colloid systems (e.g., emulsions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily organic\* liquid.
- 77+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily non-bituminous solid.
- 901, for a collection of art related to colloid systems of substantially pure carbon, such as graphite, diamond, carbon black, lamp black, fullerenes.
- 905+, for a collection of art under the class definition which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition containing said agent\* and lacking both dispersant\* and dispersand\*.

SEE OR SEARCH CLASS:

- 44, Fuel and Related Compositions, subclasses 301+ for liquid fuels comprising an emulsion, such as water-gasoline emulsions or microemulsions.
- 60, Power Plants, subclass 39.464 for reaction motor having means to produce combustion products wherein the fuel may be a solid, slurry, emulsion, dispersion, or suspension.
- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 61.44+ for determining content or effect of a constituent of a mixture of plural liquids (e.g., multiphase liquid)).
- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which may be emulsions, dispersions, suspensions, which are not elsewhere classified.
- 138, Pipes and Tubular Conduits. See subclasses 40+ for some devices disclosed for the purpose of forming a mixture or emulsion of a plurality of fluids but in which the claims are limited to the structure of the conduit and the flow restrictor.
- 210, Liquid Purification or Separation, subclasses 634+ for liquid/liquid solvent or colloid dispersion extraction.
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252. See subclasses 610+ for fire retarding compositions in the form of dispersion or colloid system, subclasses 8.57, 8.61+, 8.81+, and 8.91+ for various specialized compositions for leather, fur, or textile treating.
- 366, Agitating, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, cross-reference art collection 605 for mixing apparatus for stirring of paint. Processes which form colloid systems, such as emulsifying or foaming, are proper for compositions classes for the claimed specified use compositions, and for Class 516 for non-specified use compositions (generic).
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 41+ for processes of storage of liquid which may involve use of a colloid system such as an emulsion or foam spread on the surface of the liquid.
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclass 455 for a capsule which contains an emulsion, dispersion, or solution, subclass 70.19 for compositions which have topical nontherapeutic utility for treating the hair or scalp of the living body (e.g. grooming or adorning aids, tonics, rinses) which contain two or more surfactants (i.e. compounds that lower the surface or interfacial tension, including detergents, foaming or wetting agents, emulsifiers, solubilizers, or dispersants) which are either desig-

- nated in the claims or are art recognized as such, subclasses 278.1+ for a claimed particular emulsifier for a nonspecific immunoeffector.
- 426, Food or Edible Material: Processes, Compositions, and Products, subclasses 531+ for per se products or processes of preparing or treating compositions involving chemical reaction by addition, combining diverse food material, or permanent additive (particularly subclasses 602+ for an aqueous emulsion in a composition having fat or oil basic ingredient other than butter in emulsion form, subclass 654 for stabilizing or preserving agent or emulsifier other than organophosphatide), subclass 519 for processes including mixing or agitating, e.g., homogenizing.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 113 for image developing composition or product which is a multiple phase liquid carrier medium, such as an emulsion, for electric or magnetic imagery, subclasses 377+ for emulsifier in a coupling compound with silver compound sensitizer in a process of color imaging using a radiation sensitive composition, subclass 493 for surfactant or emulsifier processing additive in a developer for nonradiation sensitive image processing compositions or process of making.
- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR 184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.
- 504, Plant Protecting and Regulating Compositions, appropriate subclasses for a plant stimulating or eradicating composition; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, antiflocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of water-in-oil emulsions. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions There-

for, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be water-in-oil emulsions. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to emulsion colloid systems include: subclasses 133+ for composition for cleaning human skin (especially subclass 158 for cream, paste, or gel), subclasses 221+ for liquid, paste, or gel composition used in automatic dishwasher, subclass 242 for liquid composition (e.g., emulsion) for removing foreign matter from surface carrying a protective or ornamental coating, finish, or adhesively attached covering (e.g., from painted or papered wall, automobile body), subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclass 280 for gel or liquid composition for cleaning pile fabric or upholstery (e.g., carpet, rug), subclass 336 for gel, cream, or paste, subclasses 337+ for liquid compositions (e.g., slurry) which may be colloid systems), subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)), subclasses 383+ for liquid, paste, or gel cleaning composition with halogen, nitrogen, oxygen, or phosphorus containing antiseptic or biocidal component, subclasses 395+ for cleaning composition with a scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), subclass 404 for cream or paste cleaning composition, subclasses 405+ for liquid cleaning compositions, especially

for chemically specified surfactants (particularly subclass 417 for plural immiscible liquid phases (e.g., emulsion, oily and aqueous layers)), subclasses 535 for surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).

514, Drug, Bio-Affecting and Body Treating Compositions, subclasses 772+ for compositions which contain a designated nonbioactive organic compound (e.g., emulsifying polymers, gelatin), cross-reference art collections 936-975 which pertain to specifically disclosed carrier systems, physical form, or specified nonbioactive ingredient (particularly cross-reference art collections 937+ for subject matter involving a composition in the form of a dispersion or emulsion).

520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses in the 520 series of classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.

524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof.

**22. Three or more phases (e.g., w/o emulsion also containing solid particle suspension):**

This subclass is indented under subclass 21. Subject matter in which the colloid system contains three or more phases of matter, for example a water-in-oil emulsion further containing solid particulates, colloid-sized or otherwise.

SEE OR SEARCH THIS CLASS, SUBCLASS:

54, for emulsions containing three or more liquid phases where the outermost continuous phase is aqueous.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 61.44+ for determining content or effect of a constituent of a mixture of plural liquids (e.g., multiphase liquid)).

106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which may be emulsions, dispersions, suspensions, which are not elsewhere classified.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 113 for image developing composition or product which is a multiple phase liquid carrier medium, such as an emulsion, for electric or magnetic imagery, subclasses 377+ for emulsifier in a coupling compound with silver compound sensitizer in a process of color imaging using a radiation sensitive composition, and subclass 493 for surfactant or emulsifier processing additive in a developer for nonradiation sensitive image processing compositions or process of making.

507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils

precipitating out during the transportation (e.g., suspending agents, anti-flocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, and subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.

508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of water-in-oil emulsions. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof, subclass 801 for process of preparing water-in-oil emulsion or dispersion, or product thereof.

**23. The agent contains organic compound containing silicon:**

This subclass is indented under subclass 21. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains silicon.

SEE OR SEARCH THIS CLASS, SUBCLASS:

13, for a similar colloid system making or stabilizing agent\* used in foam colloid system.

- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 38, for a similar subject matter (unless provided by an indented subclass of specifically provided for organic\* compounds) used in bituminous-in-aqueous emulsions.
- 55, for a similar colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 24. The agent contains organic compound containing phosphorus (e.g. lecithin):**  
This subclass is indented under subclass 21. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains phosphorus.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 13, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 40, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 56+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 25. The agent contains organic compound containing sulfoxy\*:**  
This subclass is indented under subclass 21. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains sulfoxy\*.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 58+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 26. The organic compound contains nitrogen, except if present solely as NH 4+:**  
This subclass is indented under subclass 25. Subject matter in which said organic\* compound containing sulfoxy\* also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 59+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**27. The agent contains organic compound containing nitrogen, except if present solely as NH 4+:**

This subclass is indented under subclass 21. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 15+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.

- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 43+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 67+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.

**28. The agent contains organic compound containing oxygen:**

This subclass is indented under subclass 21. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains oxygen.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 46+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**29. The compound contains -C(=O)O- (e.g., glyceride):**

This subclass is indented under subclass 28. Subject matter in which the organic\* compound which contains oxygen contains -C(=O)O- (e.g., glyceride).

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 46+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**30. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 28. Subject matter in which the organic\* compound which contains oxygen contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.



## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semisolid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 46+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**31. Discontinuous phase material primarily solid or semisolid (e.g., colloid dispersion of gel particles, or paraffin wax, or polytetrafluoroethylene):**

This subclass is indented under subclass 20. Subject matter in which the colloid system comprises primarily organic\* continuous liquid phase with a discontinuous phase of primarily solid or semisolid material\*.

- (1) Note. "Primarily solid or semisolid" means that 50% or more of the discontinuous phase is solid or semisolid or both, by weight, volume, molecule, or atom.

- (2) Note. Organosols\*, which are proper for this and indented subclasses, may be an intermediate material\* in making aquasols, which are proper for lower in this class schedule.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 9, for colloid systems based on continuous liquid phase (e.g., emulsions, suspensions, or dispersions) in which it is unknown whether the continuous liquid phase is aqueous or organic\*.
- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase, i.e., foam, especially subclass 11 for such systems containing particulate solid.
- 20, for oil-in-oil emulsions, and other discontinuous organic\* liquid phase dispersed in continuous organic\* liquid phase.
- 21+, for emulsions in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* liquid, such as water-in-oil emulsions.
- 32, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily elemental carbon, such as graphite or diamond dispersed or suspended in oil or other primarily organic\* continuous liquid phase.
- 38+, for colloid systems (e.g., emulsions, suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily bituminous, coal, or carbon.
- 53+, for colloid systems (e.g., emulsions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily organic\* liquid.
- 77+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily nonbituminous solid.
- 78+, for aquasols.
- 901, for a collection of art related to colloid systems of substantially pure carbon,

- such as graphite, diamond, carbon black, lamp black, Fullerenes.
- 905+, for a collection of art under the class definition which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition containing said agent\* and lacking both dispersant\* and dispersand\*.
- SEE OR SEARCH CLASS:
- 44, Fuel and Related Compositions, subclasses 280+ for solid carbonaceous fuel dispersed in a liquid medium, such as dispersed coal.
- 60, Power Plants, subclass 39.464 for reaction motor having means to produce combustion products wherein the fuel may be a solid, slurry, emulsion, dispersion, or suspension.
- 65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.
- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 61.63+ for determining settling ability of sediment constituent of a liquid mixture, subclasses 71.71+ for determining content or effect of a solid component (e.g., particles) constituent of a liquid mixture, and subclasses 64.41+ for a process or an apparatus for detecting or determining the composition of, a constituent of, or a property of a liquid or a liquid suspension of a solid and the determination is made by measuring or detecting the ability of the liquid to coagulate, to form a clot, or to form a stiffened or solid colloid-like mass (e.g., gel)).
- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which may be emulsions, dispersions, suspensions, which are not elsewhere classified.
- 162, Paper Making and Fiber Liberation. See subclasses 1+ for processes of liberation (especially subclasses 70+ for compositions specifically employed in or intended to be employed in the Class provided for processes).
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclass 74 for the reproduction or formation of powder, flakes, or colloid-sized particles by electrodeposition in which the deposit does not remain with the base upon which deposition is made and compositions therefor, subclasses 334+ for processes or compositions for the preparation of chemical compounds or of elements by means of electrolytic action (especially subclass 352 for processes wherein an emulsion, dispersion, or suspension is utilized as the electrolyte or bath, and subclass 353 for processes wherein an electrolyte system having two or more separate, immiscible layers are utilized).
- 209, Classifying, Separating, and Assorting Solids, subclass 5 for methods or apparatus for treatment of materials or items prior to their separation to facilitate the latter in which certain components of a mixture may be deflocculated or dispersed relatively to others or by which certain components may be flocculated (this subclass receives only methods and apparatus in which the deflocculation or coagulation is contributory to a subsequent separation of some components from others).
- 241, Solid Material Comminution or Disintegration, subclasses 15+ (particularly subclass 16) for processes for producing non-colloid suspensions of a solid in a liquid by comminuting operations, and subclasses 38+ for apparatus which may produce suspensions of a solid in a liquid by comminuting operations, whether such suspensions be disclosed as colloidal or not.
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including

- those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252. See subclasses 186.1+ for compositions for bleaching by oxidation, or in other oxidation of extraneous substances, or in generating oxygen, subclass 363.5 for finely divided solids combined with an agent to facilitate dispersion, subclasses 610+ for fire retarding compositions in the form of dispersion or colloid system, and subclasses 634+ for radioactive compositions in the form of sol solution or gel.
- 366, Agitating, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, and cross-reference art collection 605 for mixing apparatus for stirring of paint. Processes which form colloid systems, such as emulsifying or foaming, are proper for compositions classes for the claimed specified use compositions, and for Class 516 for non-specified use compositions (generic).
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclass 455 for a capsule which contains an emulsion, dispersion, or solution, subclass 70.19 for compositions which have topical nontherapeutic utility for treating the hair or scalp of the living body (e.g. grooming or adorning aids, tonics, rinses) which contain two or more surfactants (i.e. compounds that lower the surface or interfacial tension, including detergents, foaming or wetting agents, emulsifiers, solubilizers, or dispersants) which are either designated in the claims or are art recognized as such.
- 504, Plant Protecting and Regulating Compositions, appropriate subclasses for a plant stimulating or eradicating composition; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use.
- 505, Superconductor Technology: Apparatus, Material, Process, subclass 165 for system, device, or component utilizing suspension of superconducting particulate material in liquid (e.g., seal, pump, etc.).
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, anti-flocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, and subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be dispersions or suspensions of solid or semi-solid material in organic liquid phase. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to dispersion or suspension colloid systems (e.g., slurry) include: subclasses 133+ for composition for cleaning human skin (especially subclass 139 for particulate containing which may be colloid-sized), subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclasses 337+ for liquid

- compositions (e.g., slurry) which may be colloid systems), subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclasses 368+ for with scrubbing or scouring component (e.g., abrasive, slurry), subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)), subclasses 395+ for cleaning composition with a scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), subclass 404 for cream or paste cleaning composition, subclasses 405+ for liquid cleaning compositions, especially for chemically specified surfactants (particularly subclass 418 for liquid and solid phases (e.g., suspension, slurry)), and subclasses 535 for surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).
- 514, Drug, Bio-Affecting and Body Treating Compositions, subclasses 772+ for compositions which contain a designated nonbioactive organic compound (e.g., emulsifying polymers, gelatin), and cross-reference art collections 936-975 which pertain to specifically disclosed carrier systems, physical form, or specified nonbioactive ingredient (particularly cross-reference art collections 937+ for subject matter involving a composition in the form of a dispersion or emulsion).
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses in the 520 series of classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.
- 524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof, cross-reference art collection 923 for subject matter involving treating or preparing nonaqueous dispersions or emulsions of solid polymer or SICP.
32. **The material primarily contains elemental carbon (e.g., graphite, diamond):**  
This subclass is indented under subclass 31. Subject matter in which the discontinuous phase material\* is primarily elemental carbon, such as graphite or diamond.
- (1) Note. "Primarily contains elemental carbon" means that 50% or more of the material\* is elemental carbon, by weight, volume, molecule, or atom.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 38+, for colloid systems (e.g., emulsions, suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily bituminous, coal, or carbon.
- 901, for a collection of art related to colloid systems of substantially pure carbon, such as graphite, diamond, carbon black, lamp black, fullerenes.
- SEE OR SEARCH CLASS:
- 44, Fuel and Related Compositions, for compositions to be used either as a fuel or as a carbonaceous reductant, subclasses 280+ for solid carbonaceous fuel dispersed in a liquid medium.
- 241, Solid Material Comminution or Disintegration, subclasses 15+ (particularly subclass 16) for processes for producing non-colloid suspensions of a solid in a liquid by comminuting operations, and subclasses 38+ for

apparatus which may produce suspensions of a solid in a liquid by comminuting operations, whether such suspensions be disclosed as colloidal or not.

- 423, Chemistry of Inorganic Compounds, subclasses 445+ for products or processes of making same wherein the product is free carbon in substantially pure form, such as, diamond, fullerenes.
- 502, Catalyst, Solid Sorbent, or Support therefor: Product or Process of Making, subclasses 416+, for sorbent compositions which are free carbon containing; the term "activated carbon" will be construed as indicating a composition comprising carbon and unidentified components, functioning as a sorbent for this Class.
- 508, Solid Anti-Friction Device, Materials Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, subclasses 113+ for lubricants containing graphite, coal, or elemental carbon which may be colloid-sized dispersion. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

**33. The material primarily contains inorganic material (e.g., chrome yellow, sodium nitrite):**

This subclass is indented under subclass 31. Subject matter in which the discontinuous phase material\* is primarily inorganic\* material\*, such as chrome yellow, or sodium nitrite.

- (1) Note. "Primarily contains inorganic\* material\*" means that 50% or more is inorganic\* material\*, by weight, volume, molecule, or atom.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 78+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily solid which is primarily inorganic\* material\*.

**SEE OR SEARCH CLASS:**

- 51, Abrasive Tool Making Process, Material, or Composition, appropriate subclasses for materials, compositions, colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods designed for an abrading purpose.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 113 for image developing composition or product which is a multiple phase liquid carrier medium, such as an emulsion, for electric or magnetic imagery, subclasses 377+ for emulsifier in a coupling compound with silver compound sensitizer in a process of color imaging using a radiation sensitive composition, and subclass 493 for surfactant or emulsifier processing additive in a developer for nonradiation sensitive image processing compositions or process of making.
- 505, Superconductor Technology: Apparatus, Material, Process, subclass 165 for system, device, or component utilizing suspension of superconducting particulate material in liquid (e.g., seal, pump, etc.).
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, anti-flocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, and subclasses 200+ for well

- treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be dispersions or suspensions of solid or semi-solid material in organic liquid phase. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to dispersion or suspension colloid systems (e.g., slurry) include: subclasses 133+ for composition for cleaning human skin (especially subclass 139 for particulate containing which may be colloid-sized), subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclasses 337+ for liquid compositions (e.g., slurry) which may be colloid systems), subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclasses 368+ for with scrubbing or scouring component (e.g., abrasive, slurry), subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)), subclasses 395+ for cleaning composition with a scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), subclass 404 for cream or paste cleaning composition, subclasses 405+ for liquid cleaning compositions, especially for chemically specified surfactants (particularly subclass 418 for liquid and solid phases (e.g., suspension, slurry)), and subclasses 535 for surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).
34. **The inorganic material primarily contains compounds containing both silicon and oxygen, or both aluminum and oxygen, or combinations thereof (e.g., silica (SiO<sub>2</sub>) organosol, silica alcosol, talc, clay):**  
This subclass is indented under subclass 33. Subject matter in which the inorganic\* material\* primarily contains one or more compounds containing both silicon and oxygen, or both aluminum and oxygen, or combinations thereof, such as silica (SiO<sub>2</sub>) organosol\*, silica alcosol, talc, or clay.
- (1) Note. "Primarily contains" means that 50% or more of the inorganic\* material\* is one or more compounds, taken together, containing both silicon and oxygen, or both aluminum and oxygen, or combinations thereof, by weight, volume, or molecule.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
79+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily solid inorganic\* material\* which is primarily a material\* which contains silicon covalently bonded to oxygen, such as, aluminum silicate, clay.
- SEE OR SEARCH CLASS:  
51, Abrasive Tool Making Process, Material, or Composition, appropriate subclasses for materials, compositions, colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods designed for an abrading purpose.  
65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.  
507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through

conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, anti-flocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, and subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.

- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

**35. The inorganic material primarily contains elemental alkali metal or primarily contains an alloy which primarily contains elemental alkali metal (e.g., sodium):**

This subclass is indented under subclass 33. Subject matter in which the inorganic\* material\* primarily contains elemental alkali metal or primarily contains an alloy which primarily contains elemental alkali metal, such as sodium.

- (1) Note. "Primarily contains" means that 50% or more of the inorganic\* material\* is elemental alkali metal or metals or

50% or more of the inorganic\* material\* is an alloy which is 50% or more elemental alkali metal or metals, by weight, volume, molecule, or atom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 78+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily solid which is primarily inorganic\* material\*.

**36. The inorganic material primarily contains antimony oxide:**

This subclass is indented under subclass 33. Subject matter in which the inorganic\* material\* primarily contains one or more Antimony oxides.

- (1) Note. "Primarily contains antimony oxide" means that 50% or more of the inorganic\* material\* is one or more antimony oxides, taken together, by weight, volume, or molecule.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 78+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily solid which is primarily inorganic\* material\*.

**37. The inorganic material primarily contains elemental sulfur:**

This subclass is indented under subclass 33. Subject matter in which the inorganic\* material\* primarily contains elemental sulfur.

- (1) Note. "Primarily contains elemental sulfur" means that 50% or more of the inorganic\* material\* is elemental sulfur, by weight, volume, molecule, or atom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 78+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily solid

which is primarily inorganic\* material\*.

**38. Aqueous continuous liquid phase and discontinuous phase primarily bituminous (e.g., asphalt, pitch, tar, montan wax, paraffin wax), or coal, or elemental carbon:**

This subclass is indented under subclass 9. Subject matter in which the colloid system contains a aqueous continuous liquid phase with a discontinuous phase which is primarily bituminous (e.g., asphalt, pitch, tar, or paraffin wax), or coal, or elemental carbon, i.e., water based suspensions or dispersions.

- (1) Note. Some early twentieth century patents claim emulsions of bituminous material in water and do not disclose the emulsifying agent\*. Such generic disclosure patents are placed in this subclass.
- (2) Note. Bituminous material\* includes solid or semi-solid hydrocarbon such as asphalt, pitch, tar, or paraffin wax.
- (3) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 9, for colloid systems based on continuous liquid phase (e.g., emulsions, suspensions, or dispersions) in which it is unknown whether the continuous liquid phase is aqueous or organic\*.
- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase, i.e., foam.
- 20, for oil-in-oil emulsions, and other discontinuous organic\* liquid phase dispersed in continuous organic\* liquid phase.
- 21+, for emulsions in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* liquid, such as water-in-oil emulsions.

31+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* (e.g., suspensions or dispersions).

32, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily elemental carbon, such as graphite or diamond dispersed or suspended in oil or other primarily organic\* continuous liquid phase.

53+, for colloid systems (e.g., emulsions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily organic\* liquid.

77+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily non-bituminous solid.

901, for a collection of art related to colloid systems of substantially pure carbon, such as graphite, diamond, carbon black, lamp black, fullerenes.

905+, for a collection of art under the class definition which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition containing said agent\* and lacking both dispersant\* and dispersand\*.

**SEE OR SEARCH CLASS:**

- 44, Fuel and Related Compositions, for compositions to be used either as a fuel or as a carbonaceous reductant, and subclasses 280+ for solid carbonaceous fuel dispersed in a liquid medium.
- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 61.63+ for determining settling ability of sediment constituent of a liquid mixture, subclasses 71.71+ for determining content or effect of a solid component (e.g., particles) constituent of a liquid mixture, and subclasses 64.41+ for a



- process or an apparatus for detecting or determining the composition of, a constituent of, or a property of a liquid or a liquid suspension of a solid and the determination is made by measuring or detecting the ability of the liquid to coagulate, to form a clot, or to form a stiffened or solid colloid-like mass (e.g., gel)).
- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which are not elsewhere classified. See subclass 271 for dispersions of paraffin wax in water which contain more than just the material necessary to produce or stabilize the dispersion, subclass 277 for bituminous emulsions which contain more than just those components necessary to form or stabilize the emulsion, and subclass 278 for bituminous dispersions which contain more than just those components necessary to form or stabilize the emulsion. The line between Class 106 and Class 516 in regard to bituminous emulsions is as follows: Processes of preparing bituminous emulsions and the emulsions so produced are placed in Class 516 even though the emulsions have utility as coating or plastic compositions, unless the emulsions claimed contain ingredients over and above those necessary for the preparation or maintenance (stabilization) of the colloid system, such as, for example, cementitious material, pigments, fillers, or aggregates.
- 138, Pipes and Tubular Conduits. See subclasses 40+ for some devices disclosed for the purpose of forming a mixture or emulsion of a plurality of fluids but in which the claims are limited to the structure of the conduit and the flow restrictor.
- 209, Classifying, Separating, and Assorting Solids, subclass 5 for methods or apparatus for treatment of materials or items prior to their separation to facilitate the latter in which certain components of a mixture may be deflocculated or dispersed relatively to others or by which certain components may be flocculated (this subclass receives only methods and apparatus in which the deflocculation or coagulation is contributory to a subsequent separation of some components from others).
- 241, Solid Material Comminution or Disintegration, subclasses 15+ (particularly subclass 16) for processes for producing non-colloid suspensions of a solid in a liquid by comminuting operations, and subclasses 38+ for apparatus which may produce suspensions of a solid in a liquid by comminuting operations, whether such suspensions be disclosed as colloidal or not.
- 366, Agitating, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, and subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, cross-reference art collection 605 for mixing apparatus for stirring of paint. Processes which form colloid systems, such as emulsifying or foaming, are proper for compositions classes for the claimed specified use compositions, and for Class 516 for nonspecified use compositions (generic).
- 423, Chemistry of Inorganic Compounds, subclasses 445+ for products or processes of making same wherein the product is free carbon in substantially pure form, such as, diamond, fullerenes.
- 502, Catalyst, Solid Sorbent, or Support therefor: Product or Process of Making, subclasses 416+, for sorbent compositions which are free carbon containing; the term "activated carbon" will be construed as indicating a composition comprising carbon and unidentified components, functioning as a sorbent for this class.
- 504, Plant Protecting and Regulating Compositions, appropriate subclasses for a plant stimulating or eradicating composition; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate

- methods which are claimed as specifically intended for such use.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, anti-flocculants).
- 508, Solid Anti-Friction Device, Materials Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, subclasses 113+ for lubricants containing graphite, coal, or elemental carbon which may be colloid-sized dispersion. This Class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic).
- 514, Drug, Bio-Affecting and Body Treating Compositions, subclasses 772+ for compositions which contain a designated nonbioactive organic compound (e.g., emulsifying polymers, gelatin), cross-reference art collections 936-975 which pertain to specifically disclosed carrier systems, physical form, or specified nonbioactive ingredient (particularly cross-reference art collections 937+ for subject matter involving a composition in the form of a dispersion or emulsion).
- 39. The agent is formed in situ from native precursor by adding inorganic alkaline material (e.g., NaOH or TSP added to in situ acid):**  
This subclass is indented under subclass 38. Subject matter in which the colloid system contains a colloid system making or stabilizing agent\*, which is formed in situ from at least one native precursor by adding inorganic\* alkaline material\* to the colloid system or a precursor of it, such as adding NaOH or TSP (trisodium phosphate) to a natively present acid.
- (1) Note. "Native precursor" means a precursor or reactant which is present in the starting material\* as derived, as contrasted with a precursor or reactant which is added. Thus, impurities of crude oil are native to the oil, and the use of one or more of them by causing reaction with an added inorganic alkaline material\* to form a product which is an agent\* for making or stabilizing a colloid system (e.g., oil-in-water) is proper for placement in this subclass.
- SEE OR SEARCH THIS CLASS, SUBCLASS:**
- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 46+, for colloid systems with agents\* of similar chemical structure which are not formed in situ from native precursor (e.g., formed from added, nonbitu-

- minous source (non-native) organic\* compound containing carboxyl, ester, or hydroxy group, reacted with an inorganic\* alkaline agent).
- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 927, for a collection of art which discloses an operation or a step of an in situ formation of colloid system making or stabilizing agent\* which includes a chemical reaction.
- 40. The agent contains organic compound containing phosphorus:**  
This subclass is indented under subclass 38. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains phosphorus.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 13, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 24, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 56+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 41. The agent contains organic compound containing sulfoxy\*:**  
This subclass is indented under subclass 38. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains sulfoxy\*.
- (1) Note. Thios, thioethers, and other non-oxygenated sulfur groups are not provided for here.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 25, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 58+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 42. The compound contains -C(=O)OH or salt thereof:**  
This subclass is indented under subclass 41. Subject matter in which the organic\* compound which contains sulfoxy\* also contains -C(=O)OH group or salt thereof.

- (1) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters (-C(=O)OR where R is an organic\* group).
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
  - 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
  - 25, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
  - 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
  - 59+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase, when the compound also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
  - 63, for a similar colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase, when the agent\* compound also contains carboxylic acid ester.
  - 64, for a similar colloid system making or stabilizing agent\* used in aqueous continuous liquid phase with primarily organic\* liquid discontinuous phase (except those compounds also having a nitrogen (except for when the nitrogen is present solely as the cationic ammonium group, NH 4+) which are in subclass 59+, or a carboxylic acid ester group, which are in subclass 63).
  - 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 43. The agent contains organic compound containing nitrogen, except if present solely as NH 4+:**
- This subclass is indented under subclass 38. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
- 15+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
  - 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
  - 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
  - 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
  - 67+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid.
  - 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 44. The compound contains plural peptide linkages, i.e., compound formed from amino acids, natural or synthetic, by reaction of a**

**carboxyl group of one such amino acid with an amino group of another same or different such amino acid:**

This subclass is indented under subclass 43. Subject matter in which the organic\* compound which contains nitrogen contains 2 or more peptide linkages, i.e., compound formed from natural or synthetic amino acids, such as casein, or glue.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 16, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 70, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**SEE OR SEARCH CLASS:**

- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed

(especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.

**45. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 43. Subject matter in which the organic\* compound which contains nitrogen contains also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 15+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 67+, for a similar colloid system making or stabilizing agent\* used in aqueous

- continuous phase with discontinuous phase primarily organic\* liquid.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 46. The agent contains organic compound containing oxygen:**  
This subclass is indented under subclass 38. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains oxygen.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 47. The compound contains -C(=O)OH group or salt thereof (e.g., soap, rosin, fatty acid):**  
This subclass is indented under subclass 46. Subject matter in which the organic\* compound which contains oxygen contains carboxylic acid group or salt thereof, such as soap, rosin, or fatty acids.
- (1) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters (-C(=O)OR where R is an organic\* group).
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 19, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

## SEE OR SEARCH CLASS:

530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, appropriate subclasses for colloid systems such as gel-like proteins. Areas known to have documents related to colloid systems or wetting agents include subclasses 200+ for natural resin derivatives which are not pure compounds, and processes of treating natural resins or derivatives (e.g., wood, gum, and tall oil rosin; wood or pine tar or pitch; shellac; copals from various sources, both recent and fossil, such as Congo, Manila, etc.; amber; dammar; kauri; coal resin; gum accroides; sandarac; cativo resin).

**48. Inorganic alkaline reactant is added in a separate step:**

This subclass is indented under subclass 47. Subject matter in which an inorganic\* alkaline reactant is added in a separate step.

- (1) Note. An example of the type of process (or composition) found in this subclass is the sequential addition of rosin and then NaOH or TSP.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

- 19, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\*

compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.

- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).

- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

## SEE OR SEARCH CLASS:

530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, appropriate subclasses for colloid systems such as gel-like proteins. Areas known to have documents related to colloid systems or wetting agents include subclasses 200+ for natural resin derivatives which are not pure compounds, and processes of treating natural resins or derivatives (e.g., wood, gum, and tall oil rosin; wood or pine tar or pitch; shellac; copals from various sources, both recent and fossil, such as Congo, Manila, etc.; amber; dammar; kauri; coal resin; gum accroides; sandarac; cativo resin).

**49. With added solid nonbituminous particulate:**

This subclass is indented under subclass 48. Subject matter in which a solid, nonbituminous particulate is added to the colloid system.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

- 19, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\*

- liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**50. With added solid nonbituminous particulate:**

This subclass is indented under subclass 46. Subject matter in which a solid, nonbituminous particulate is added to the colloid system.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 19, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\*

compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.

- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**SEE OR SEARCH CLASS:**

- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

**51. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 46. Subject matter in which organic\* compound containing oxygen contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other.



Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 72+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion).
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**52. The agent contains specified solid nonbituminous particulate (e.g., clay):**

This subclass is indented under subclass 46. Subject matter in which the colloid system making or stabilizing agent\* contains a specified solid, nonbituminous particulate material\*, such as clay.

**SEE OR SEARCH CLASS:**

- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces,

and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses

136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

**53. Aqueous continuous liquid phase and discontinuous phase primarily organic liquid (e.g., organosilicon\* oil- or mineral-oil\*-in-water, o/w emulsion):**

This subclass is indented under subclass 9. Subject matter in which the colloid system contains a aqueous continuous liquid phase with a discontinuous phase which is primarily organic\* liquid, such as organosilicon\* oil- or mineral-oil\*-in-water, o/w emulsion.

- (1) Note. Primarily organic\* means that 50% or more of that liquid phase is organic\* material\*, by weight, volume, or molecule.
- (2) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.
- (3) Note. See this class definition, in Section II, LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, subsection C., Guidelines for OR (Original Reference) and XR (Cross Reference) Placement, hereinabove, for explanation of placement requirements for refer-

ences. A generically claimed colloid system or making composition which is not provided for in the USPCS, requires an XR herein. Further, the placement of any generic claim must be premised on that generic disclosure rather than upon a specific use for which a classification is already made elsewhere (such as those classes which provide for solely disclosed subject matter). For example, a surfactant mixture solely disclosed as an aqueous phase laundry cleaning agent (which is inferred to define an oil-in-water system) and generically described as useful for surfactant uses or other such broad language which does not afford determination of or limitation to a specific continuous phase is placed in this subclass because no continuous phase is specified. If the broad language does specify the continuous and/or discontinuous phase so as to satisfy an indented subclass area, then and only then placement is made therein; multiple placements made be required in the case of generic and subgeneric type disclosures. In summation, users of this class schedule should locate all broadly defined liquid phase surfactants in this subclass if the continuous phase is generic.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 9, for colloid systems based on continuous liquid phase (e.g., emulsions, suspensions, or dispersions) in which it is unknown whether the continuous liquid phase is aqueous or organic\*.
- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase, i.e., foam.
- 20, for oil-in-oil emulsions, and other discontinuous organic\* liquid phase dispersed in continuous organic\* liquid phase.
- 21+, for emulsions in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* liquid, such as water-in-oil emulsions.
- 31+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase

is primarily solid or semisolid material\* (e.g., suspensions or dispersions).

- 32, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily elemental carbon, such as graphite or diamond dispersed or suspended in oil or other primarily organic\* continuous liquid phase.
- 38+, for colloid systems (e.g., emulsions, suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily bituminous, coal, or carbon.
- 77+, for colloid systems (e.g., suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily non-bituminous solid.
- 901, for a collection of art related to colloid systems of substantially pure carbon, such as graphite, diamond, carbon black, lamp black, fullerenes.
- 905+, for a collection of art under the class definition which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition containing said agent\* and lacking both dispersant\* and dispersand\*.

**SEE OR SEARCH CLASS:**

- 44, Fuel and Related Compositions, subclasses 301+ for liquid fuels comprising an emulsion, such as water-gasoline emulsions or microemulsions.
- 60, Power Plants, subclass 39.464 for reaction motor having means to produce combustion products wherein the fuel may be a solid, slurry, emulsion, dispersion, or suspension.
- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 61.44+ for determining content or effect of a constituent of a mixture of plural liquids (e.g., multiphase liquid)).

- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which may be emulsions, dispersions, suspensions, which are not elsewhere classified.
- 137, Fluid Handling, subclass 13 for processes in which flow of fluent material is facilitated by the addition of material which affects the flow characteristics of the fluent material (e.g., suspending agent, viscosity reducing agent), or by the application of heat or other forms of energy.
- 138, Pipes and Tubular Conduits. See subclasses 40+ for some devices disclosed for the purpose of forming a mixture or emulsion of a plurality of fluids but in which the claims are limited to the structure of the conduit and the flow restrictor.
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclasses 334+ for processes or compositions for the preparation of chemical compounds or of elements by means of electrolytic action (especially subclass 352 for processes wherein an emulsion, dispersion, or suspension is utilized as the electrolyte or bath, subclass 353 for processes wherein an electrolyte system having two or more separate, immiscible layers are utilized), subclass 699 for processes in which the material is organic which contains (a) a natural or synthetic elastic polymer commonly known as rubber (e.g., caoutchouc, neoprene, etc.) or (b) a dispersion or emulsion of a natural or synthetic elastic polymer in water commonly known as latex.
- 210, Liquid Purification or Separation, subclasses 634+ for liquid/liquid solvent or colloid dispersion extraction.
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252.
- 366, Agitating, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, and subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, cross-reference art collection 605 for mixing apparatus for stirring of paint. Processes which form colloid systems, such as emulsifying or foaming, are proper for compositions classes for the claimed specified use compositions, and for Class 516 for non-specified use compositions (generic).
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 41+ for processes of storage of liquid which may involve use of a colloid system such as an emulsion or foam spread on the surface of the liquid.
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclass 455 for a capsule which contains an emulsion, dispersion, or solution, subclass 70.19 for compositions which have topical nontherapeutic utility for treating the hair or scalp of the living body (e.g. grooming or adorning aids, tonics, rinses) which contain two or more surfactants (i.e. compounds that lower the surface or interfacial tension, including detergents, foaming or wetting agents, emulsifiers, solubilizers, or dispersants) which are either designated in the claims or are art recognized as such, and subclasses 278.1+ for a claimed particular emulsifier for a nonspecific immunoeffector.
- 426, Food or Edible Material: Processes, Compositions, and Products, subclasses 531+ for per se products or processes of preparing or treating compositions involving chemical reaction by addition, combining diverse food material, or permanent additive (particularly subclasses 602+ for an aqueous emulsion in a composition having fat or oil basic ingredient other than butter in emulsion form, subclass 654 for stabilizing or

- preserving agent or emulsifier other than organophosphatide), and subclass 519 for processes including mixing or agitating, e.g., homogenizing.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 113 for image developing composition or product which is a multiple phase liquid carrier medium, such as an emulsion, for electric or magnetic imagery, subclasses 377+ for emulsifier in a coupling compound with silver compound sensitizer in a process of color imaging using a radiation sensitive composition, and subclass 493 for surfactant or emulsifier processing additive in a developer for nonradiation sensitive image processing compositions or process of making.
- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR 184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.
- 504, Plant Protecting and Regulating Compositions, appropriate subclasses for a plant stimulating or eradicating composition; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, antiflocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, and subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of oil-in-water emulsions. This Class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be oil-in-water emulsion. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to

- oil-in-water emulsion colloid systems include: subclasses 133+ for composition for cleaning human skin (especially subclass 158 for cream, paste, or gel), subclasses 221+ for liquid, paste, or gel composition used in automatic dishwasher, subclass 242 for liquid composition (e.g., emulsion) for removing foreign matter from surface carrying a protective or ornamental coating, finish, or adhesively attached covering (e.g., from painted or papered wall, automobile body), subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclass 280 for gel or liquid composition for cleaning pile fabric or upholstery (e.g., carpet, rug), subclass 336 for gel, cream, or paste, subclasses 337+ for liquid compositions), subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)), subclasses 383+ for liquid, paste, or gel cleaning composition with halogen, nitrogen, oxygen, or phosphorus containing antiseptic or biocidal component, subclasses 395+ for cleaning composition with a scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), subclass 404 for cream or paste cleaning composition, subclasses 405+ for liquid cleaning compositions, especially for chemically specified surfactants (particularly subclass 417 for plural immiscible liquid phases (e.g., emulsion, oily and aqueous layers)), subclasses 535 for surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).
- 514, Drug, Bio-Affecting and Body Treating Compositions, subclasses 772+ for compositions which contain a designated nonbioactive organic compound (e.g., emulsifying polymers, gelatin), cross-reference art collections 936-975 which pertain to specifically disclosed carrier systems, physical form, or specified nonbioactive ingredient (particularly cross-reference art collections 937+ for subject matter involving a composition in the form of a dispersion or emulsion).
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses in the 520 series of classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.
- 524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof.
- 528, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, cross-reference art collections 934+ for subject matter relating to recovery and physical processing of natural rubber latex (particularly cross-reference art collection 936 for coagulating).
54. **Three or more liquid phases (e.g., water-in-oil-in-water, w/o/w emulsion):**  
This subclass is indented under subclass 53. Subject matter in which the colloid system contains three or more liquid phases of matter, such as water-in-oil-in-water emulsions.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
22, for a similar colloid system containing organic\*-in-water-in-organic\*.

## SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 61.44+ for determining content or effect of a constituent of a mixture of plural liquids (e.g., multiphase liquid)).
- 210, Liquid Purification or Separation, subclasses 634+ for liquid/liquid solvent or colloid dispersion extraction.
- 366, Agitating, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, and subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, cross-reference art collection 605 for mixing apparatus for stirring of paint. Processes which form colloid systems, such as emulsifying or foaming, are proper for compositions classes for the claimed specified use compositions, and for Class 516 for nonspecified use compositions (generic).
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 41+ for processes of storage of liquid which may involve use of a colloid system such as an emulsion or foam spread on the surface of the liquid.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 113 for image developing composition or product which is a multiple phase liquid carrier medium, such as an emulsion, for electric or magnetic imagery, subclasses 377+ for emulsifier in a coupling compound with silver compound sensitizer in a process of color imaging using a radiation sensitive composition, and subclass 493 for surfactant or emulsifier processing additive in a developer for nonradiation sensitive image processing compositions or process of making.
- 504, Plant Protecting and Regulating Compositions, appropriate subclasses for a plant stimulating or eradicating composition; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate

methods which are claimed as specifically intended for such use.

- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, anti-flocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, and subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.
- 524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof, subclass 801 for process of preparing water-in-oil emulsion or dispersion, or product thereof.

**55. The agent contains organic compound containing silicon :**

This subclass is indented under subclass 53. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains silicon.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

- 13, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 23, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inor-

- ganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 38, for a similar subject matter (unless provided by an indented subclass of specifically provided for organic\* compounds) used in bituminous-in-aqueous emulsions.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 56. The agent contains organic compound containing phosphorus (e.g. lecithin):**  
This subclass is indented under subclass 53. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains phosphorus, such as lecithin.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 13, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 24, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 40, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**57. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 56. Subject matter in which the organic\* compound which contains phosphorus contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 13, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 24, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 40, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

- 58. The agent contains organic compound containing sulfoxy\* (e.g., sodium lauryl sulfate):**  
This subclass is indented under subclass 53. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains sulfoxy\*, such as sodium lauryl sulfate.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 25, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**59. The compound contains nitrogen, except if present solely as NH 4+ (e.g., isopropylammonium dodecylbenzene sulfonate):**

This subclass is indented under subclass 58. Subject matter in which the organic\* compound containing sulfoxy\* also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+, such as isopropylammonium dodecylbenzene sulfonate.

- (1) Note. Organic\* compound containing sulfoxy\* also containing nitrogen does include organic\* ammonium salts of inorganic\* sulfate anion.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\*

liquid discontinuous phase (e.g., oil-in-oil emulsion).

- 26, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**60. The nitrogen is a ring member:**

This subclass is indented under subclass 59. Subject matter in which the nitrogen containing organic\* compound contains a ring structure which includes nitrogen.

- (1) Note: In order to be considered a ring, nonionic bonding must exist between all ring members. Inner salt compounds such as betaines, sulfobetaines, etc., wherein two ring members are attached to each other by ionic bonding, are not regarded as rings for purposes of this subclass.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 26, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.



- tinuous phase primarily solid or semi-solid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 61. The compound contains -S(O<sub>2</sub>)NHH where substitution may be made for the hydrogen:**  
This subclass is indented under subclass 59. Subject matter in which the nitrogen containing organic\* compound contains -S(O<sub>2</sub>)NHH group where substitution may be made for the hydrogen.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 26, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 62. The compound contains -C(=O)NHH where substitution may be made for the hydrogen:**  
This subclass is indented under subclass 59. Subject matter in which the nitrogen containing organic\* compound contains -C(=O)NHH

group where substitution may be made for the hydrogen.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 26, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

- 63. The compound contains carboxylic acid ester group (e.g., partial ester, mixed ester):**  
This subclass is indented under subclass 58. Subject matter in which the organic\* compound containing sulfoxy\* also contains carboxylic acid ester group, such as, partial ester, mixed esters.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 25, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inor-

- ganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 64. The compound contains -C(=O)OH or salt thereof:**  
This subclass is indented under subclass 58. Subject matter in which the organic\* compound containing sulfoxy\* also contains -C(=O)OH group or salt thereof.
- (1) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters (-C(=O)OR where R is an organic\* group).
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 25, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 42, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 65. The compound is mineral-oil\* sulfonic acid (e.g., mahogany\* or green\* acid):**  
This subclass is indented under subclass 58. Subject matter in which the organic\* compound containing sulfoxy\* is mineral-oil\* sulfonic acid, such as, mahogany\* or green\* acid(s).
- (1) Note. Mineral-oil\* sulfonic acid results from mineral-oil\* which has been sulfonated, e.g., by sulfuric acid. Mahogany\* acid is the oil-soluble fraction of sulfonation of petroleum\* oil; green\* acid is the oil-insoluble fraction of sulfonation of petroleum\* oil.
- (2) Note. A substantially pure hydrocarbon is not a mineral-oil\*, hence the sulfonation product of such does not constitute an agent\* for colloid system making or stabilizing for this subclass.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 25, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**66. The compound contains substituted or unsubstituted benzene ring (e.g., di-butyl-naphthalene sulfonic acid):**

This subclass is indented under subclass 58. Subject matter in which the organic\* compound containing sulfoxy\* also contains substituted or unsubstituted benzene ring, such as, di-butyl-naphthalene sulfonic acid. (1) Note. The agent\* may be a mixture of sulfonated benzene ring containing compounds. However, if the feedstock for sulfonation was a mineral-oil\* (see glossary definition) then the subject matter is located above.

- (1) Note. The agent\* may be a mixture of sulfonated benzene ring containing compounds. However, if the feedstock for sulfonation was a mineral-oil\* (see glossary definition) then the subject matter is located above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 14, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 25, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 41+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**67. The agent contains organic compound containing nitrogen, except if present solely as NH 4+:**

This subclass is indented under subclass 53. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 15+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 43+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 59+, for a similar colloid system making or stabilizing agent\* which includes sulfoxy\*.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**68. The nitrogen is a ring member (e.g., polyisocyanurate):**

This subclass is indented under subclass 67. Subject matter in which the organic\* compound which contains nitrogen contains the nitrogen in a ring structure, such as polyisocyanurate.

- (1) Note: In order to be considered a ring, nonionic bonding must exist between all ring members. Inner salt compounds such as betaines, sulfobetaines, etc., wherein two ring members are attached to each other by ionic bonding, are not regarded as rings for purposes of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 15+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 43+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 60, for a similar colloid system making or stabilizing agent\* which includes sulfoxy\*.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

SEE OR SEARCH CLASS:

- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting mate-

rial or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR 184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.

**69. The compound contains -C(=O)NHH where substitution may be made for the hydrogen:**

This subclass is indented under subclass 67. Subject matter in which the organic\* compound which contains nitrogen contains the -C(=O)NHH group where substitution may be made for the hydrogen.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 15+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.

- 43+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 60, for a similar colloid system making or stabilizing agent\* which includes sulfoxy\*.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 70. The compound contains plural peptide linkages, i.e., compound formed from amino acids, natural or synthetic, by reaction of a carboxyl group of one such amino acid with an amino group of another same or different such amino acid:**  
This subclass is indented under subclass 69. Subject matter in which the organic\* compound which contains nitrogen contains 2 or more peptide linkages, i.e., compound formed from amino acids, whether natural or synthetic, such as, soya protein, gelatin.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 16, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 44, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 60, for a similar colloid system making or stabilizing agent\* which includes sulfoxy\*.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.
- 71. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**  
This subclass is indented under subclass 67. Subject matter in which the organic\* compound which contains nitrogen contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).
- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 17, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 27, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 45, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 60, for a similar colloid system making or stabilizing agent\* which includes sulfoxy\*.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**72. The agent contains organic compound containing oxygen:**

This subclass is indented under subclass 53. Subject matter in which the colloid system making or stabilizing agent\* contains an organic\* compound which contains oxygen.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 46+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**73. The compound contains carboxylic acid ester group (e.g., partial ester, natural (glyceride) oil):**

This subclass is indented under subclass 72. Subject matter in which the organic\* compound which contains oxygen contains carboxylic acid ester group, such as partial esters, natural (glyceride) oils.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 46+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**74. The carboxylic acid ester group containing compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 73. Subject matter in which the organic\* compound which contains carboxylic acid ester group contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 46+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**75. The compound contains -C(=O)OH or salt thereof (e.g., alkali metal soap):**

This subclass is indented under subclass 72. Subject matter in which the organic\* compound which contains oxygen contains -C(=O)OH group or salt thereof, such as, alkali metal soap. d (1)d ( ) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters (represented by -C(=O)OR where R is an organic\* group).

- (1) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters (represented by -C(=O)OR where R is an organic\* group).

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 46+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**76. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 72. Subject matter in which the organic\* compound which contains oxygen contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 18+, for a similar colloid system making or stabilizing agent\* used in foam colloid system.
- 20, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with organic\* liquid discontinuous phase (e.g., oil-in-oil emulsion).
- 28+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with inorganic\* liquid discontinuous phase (e.g., water-in-oil emulsion).
- 31+, for a similar colloid system making or stabilizing agent\* used in organic\* liquid continuous phase with discontinuous phase primarily solid or semi-solid.
- 39, for a similar colloid system making or stabilizing agent\* where the organic\* compound which contains oxygen is derived from a native precursor in the bituminous material\* and it is subjected to an in situ reaction with an inorganic\* alkaline agent.
- 46+, for a similar colloid system making or stabilizing agent\* used in bituminous-in-aqueous emulsion.
- 77+, for a similar colloid system making or stabilizing agent\* used in aqueous continuous phase with discontinuous phase primarily (nonbituminous) solid.

**77. Aqueous continuous liquid phase and discontinuous phase primarily solid (e.g., water based suspensions, dispersions, or certain sols\*, of natural or synthetic ester-wax, beeswax, carnauba wax; or latex dispersion):**

This subclass is indented under subclass 9. Subject matter in which the colloid system contains a aqueous continuous liquid phase with a discontinuous phase which is primarily solid, such as, water based suspensions, dispersions, or certain sols\* of natural or synthetic ester-wax, beeswax, carnauba wax, or latex dispersion).

- (1) Note. "Primarily solid" means that 50% or more of the discontinuous phase is

solid material\*, by weight, volume, molecule, or atom.

- (2) Note. This is the residual subclass for gel particle dispersion since no indented subclass provides for this subject matter.
- (3) Note. This is the residual subclass for dispersion of solid primarily organic\* material\* since no indented subclass provides for this subject matter.
- (4) Note. Dispersion agent\* composition intended for dispersing colloid-sized solid polyurethane into aqueous continuous phase, either alone or combined with said polyurethane (but absent said continuous aqueous phase), is proper for this subclass since no indented subclass provides for this subject matter. See class definition note (4) herein above.
- (5) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 9, for colloid systems based on continuous liquid phase (e.g., emulsions, suspensions, or dispersions) in which it is unknown whether the continuous liquid phase is aqueous or organic\*.
- 10+, for colloid systems of continuous liquid phase and a discontinuous gas or vapor phase, i.e., foam.
- 20, for oil-in-oil emulsions, and other discontinuous organic\* liquid phase dispersed in continuous organic\* liquid phase.
- 21+, for emulsions in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* liquid, such as water-in-oil emulsions.
- 31+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid mate-



- rial\* (e.g., suspensions or dispersions).
- 32, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily elemental carbon, such as graphite or diamond dispersed or suspended in oil or other primarily organic\* continuous liquid phase.
- 38+, for colloid systems (e.g., emulsions, suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily bituminous, coal, or carbon.
- 53+, for colloid systems (e.g., emulsions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily organic\* liquid.
- 901, for a collection of art related to colloid systems of substantially pure carbon, such as graphite, diamond, carbon black, lamp black, Fullerenes.
- 905+, for a collection of art under the class definition which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition containing said agent\* and lacking both dispersant\* and dispersand\*.

## SEE OR SEARCH CLASS:

- 60, Power Plants, subclass 39.464 for reaction motor having means to produce combustion products wherein the fuel may be a solid, slurry, emulsion, dispersion, or suspension.
- 62, Refrigeration, subclass 54.1 for process or apparatus for storing a cryogen as a mixture of diverse phases, such as, a gel or colloid suspension.
- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 61.63+ for determining settling ability of sediment constituent of a liquid mixture, subclasses 71.71+ for determining content or effect of a solid component (e.g., particles) constituent of a liquid mixture, and subclasses 64.41+ for a process or an apparatus for detecting or determining the composition of, a constituent of, or a property of a liquid or a liquid suspension of a solid and the determination is made by measuring or detecting the ability of the liquid to coagulate, to form a clot, or to form a stiffened or solid colloid-like mass (e.g., gel)).
- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which may be emulsions, dispersions, suspensions, which are not elsewhere classified. See subclass 646 for inorganic settable composition containing protein which sets or hardens when mixed with water or aqueous solutions, usually forming a hard, stone-like product, and forming foam, cellular, hollow, or porous material.
- 137, Fluid Handling, subclass 13 for processes in which flow of fluent material is facilitated by the addition of material which affects the flow characteristics of the fluent material (e.g., suspending agent, viscosity reducing agent), or by the application of heat or other forms of energy.
- 162, Paper Making and Fiber Liberation. See subclasses 1+ for processes of liberation (especially subclasses 70+ for compositions specifically employed in or intended to be employed in the class provided for processes).
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclass 74 for the reproduction or formation of powder, flakes, or colloid-sized particles by electrodeposition in which the deposit does not remain with the base upon which deposition is made and compositions therefor, subclasses 334+ for processes or compositions for the preparation of chemical compounds or of elements by means of electrolytic action (especially subclass 352 for processes wherein an emulsion, dispersion, or suspension is utilized as the electrolyte or bath, and subclass 353 for processes wherein an electrolyte system

- having two or more separate, immiscible layers are utilized).
- 209, Classifying, Separating, and Assorting Solids, subclass 5 for methods or apparatus for treatment of materials or items prior to their separation to facilitate the latter in which certain components of a mixture may be deflocculated or dispersed relatively to others or by which certain components may be flocculated (this subclass receives only methods and apparatus in which the deflocculation or coagulation is contributory to a subsequent separation of some components from others).
- 241, Solid Material Comminution or Disintegration, subclasses 15+ (particularly subclass 16) for processes for producing non-colloid suspensions of a solid in a liquid by comminuting operations, and subclasses 38+ for apparatus which may produce suspensions of a solid in a liquid by comminuting operations, whether such suspensions be disclosed as colloidal or not.
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252. See subclasses 186.1+ for compositions for bleaching by oxidation, or in other oxidation of extraneous substances, or in generating oxygen, subclass 363.5 for finely divided solids combined with an agent to facilitate dispersion, subclasses 610+ for fire retarding compositions in the form of dispersion or colloid system, and subclasses 634+ for radioactive compositions in the form of sol solution or gel.
- 366, Agitating, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, cross-reference art collection 605 for mixing apparatus for stirring of paint. Processes which form colloid systems, such as emulsifying or foaming, are proper for compositions classes for the claimed specified use compositions, and for Class 516 for non-specified use compositions (generic).
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclass 455 for a capsule which contains an emulsion, dispersion, or solution, subclass 70.19 for compositions which have topical nontherapeutic utility for treating the hair or scalp of the living body (e.g. grooming or adorning aids, tonics, rinses) which contain two or more surfactants (i.e. compounds that lower the surface or interfacial tension, including detergents, foaming or wetting agents, emulsifiers, solubilizers, or dispersants) which are either designated in the claims or are art recognized as such.
- 504, Plant Protecting and Regulating Compositions, appropriate subclasses for a plant stimulating or eradicating composition; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, anti-flocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, and subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions There-

for, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be suspensions or dispersions of solid in aqueous phase (e.g., slurry). Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to suspensions or dispersions of solid in aqueous phase (e.g., slurry) colloid systems include: subclasses 112+ for compositions for cleaning contact lenses (especially subclass 113 for compositions including solid particulate component which may be a colloid system (suspension)), subclasses 133+ for composition for cleaning human skin (especially subclass 139 for particulate containing which may be colloid-sized), subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclasses 337+ for liquid compositions (e.g., slurry) which may be colloid systems), subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclasses 368+ for with scrubbing or scouring component (e.g., abrasive, slurry), subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)), subclasses 383+ for liquid, paste, or gel cleaning composition with halogen, nitrogen, oxygen, or phosphorus containing antiseptic or biocidal component, subclasses 395+ for cleaning composition with a scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), subclasses 405+ for liquid cleaning compositions, especially for chemically specified surfactants (particularly subclass 418 for liquid and solid phases (e.g., suspension, slurry)), and subclasses 535 for

surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).

- 514, Drug, Bio-Affecting and Body Treating Compositions, subclasses 772+ for compositions which contain a designated nonbioactive organic compound (e.g., emulsifying polymers, gelatin), cross-reference art collections 936-975 which pertain to specifically disclosed carrier systems, physical form, or specified nonbioactive ingredient (particularly cross-reference art collections 937+ for subject matter involving a composition in the form of a dispersion or emulsion).
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses in the 520 series of classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.
- 524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof.
- 528, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, cross-reference art collections 934+ for subject matter relating to recovery and physical processing of natural rubber latex (particularly cross-reference art collection 936 for coagulating).

- 530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, appropriate subclasses for colloid systems such as gel-like proteins; areas known to have documents related to colloid systems include: subclasses 354+ for gelatin, subclass 356 for collagen, subclasses 360+ for casein or caseinate, subclasses 362+ for albumin, subclasses 370+ for plant or yeast proteins, and subclasses 380+ for blood proteins (particularly 381+ for blood coagulation factors and fibrin, e.g., thromboplastin).

**78. Said solid is primarily inorganic material (e.g., mercurous halide):**

This subclass is indented under subclass 77. Subject matter in which said primarily solid discontinuous phase is primarily inorganic\* material\*, such as, mercurous halide.

- (1) Note. "Primarily inorganic\* material\*" means that 50% or more of the solid phase is inorganic\* material\*, by weight, volume, molecule, or atom.
- (2) Note. Dispersed mercurous halide is proper for this subclass since no indented subclass provides for this subject matter.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 32, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily elemental carbon, such as graphite or diamond dispersed or suspended in oil or other primarily organic\* continuous liquid phase.
- 33+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily inorganic\* material\*.

**SEE OR SEARCH CLASS:**

- 51, Abrasive Tool Making Process, Material, or Composition, appropriate subclasses for materials, compositions, colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods designed for an abrading purpose.
- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 61.63+ for determining settling ability of sediment constituent of a liquid mixture, subclasses 71.71+ for determining content or effect of a solid component (e.g., particles) constituent of a liquid mixture, and subclasses 64.41+ for a process or an apparatus for detecting or determining the composition of, a constituent of, or a property of a liquid or a liquid suspension of a solid and the determination is made by measuring or detecting the ability of the liquid to coagulate, to form a clot, or to form a stiffened or solid colloid-like mass (e.g., gel)).
- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which are not elsewhere classified. See subclass 646 for inorganic settable composition containing protein which sets or hardens when mixed with water or aqueous solutions, usually forming a hard, stone-like product, and forming foam, cellular, hollow, or porous material.
- 137, Fluid Handling, subclass 13 for processes in which flow of fluent material is facilitated by the addition of material which affects the flow characteristics of the fluent material (e.g., suspending agent, viscosity reducing agent), or by the application of heat or other forms of energy.
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specif-

- ically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252. See subclasses 186.1+ for compositions for bleaching by oxidation, or in other oxidation of extraneous substances, or in generating oxygen, subclass 363.5 for finely divided solids combined with an agent to facilitate dispersion, subclasses 610+ for fire retarding compositions in the form of dispersion or colloid system, and subclasses 634+ for radioactive compositions in the form of sol solution or gel.
- 366, Agitating, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, cross-reference art collection 605 for mixing apparatus for stirring of paint. Processes which form colloid systems, such as emulsifying or foaming, are proper for compositions classes for the claimed specified use compositions, and for Class 516 for non-specified use compositions (generic).
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, antiflocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, and subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be suspensions or dispersions of solid in aqueous phase (e.g., slurry). Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to suspensions or dispersions of solid in aqueous phase (e.g., slurry) colloid systems include: subclasses 112+ for compositions for cleaning contact lenses (especially subclass 113 for compositions including solid particulate component which may be a colloid system (suspension)), subclasses 133+ for composition for cleaning human skin (especially subclass 139 for particulate containing which may be colloid-sized), subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclasses 337+ for liquid compositions (e.g., slurry) which may be colloid systems), subclasses 367+ for cleaning compositions with oxy-

gen or halogen containing chemical bleach or oxidant component (particularly subclasses 368+ for with scrubbing or scouring component (e.g., abrasive, slurry), subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)), subclasses 383+ for liquid, paste, or gel cleaning composition with halogen, nitrogen, oxygen, or phosphorus containing antiseptic or biocidal component, subclasses 395+ for cleaning composition with a scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), subclasses 405+ for liquid cleaning compositions, especially for chemically specified surfactants (particularly subclass 418 for liquid and solid phases (e.g., suspension, slurry)), and subclasses 535 for surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).

**79. The material primarily contains compound containing silicon covalently bonded to oxygen (e.g., aluminum silicate, clay):**

This subclass is indented under subclass 78. Subject matter in which said solid inorganic\* material\* primarily contains one or more compounds containing silicon covalently bonded to oxygen, such as, aluminum silicate, clay.

- (1) Note. "Primarily contains compound containing silicon covalently bonded to oxygen" means that 50% or more of the inorganic\* material\*, by weight, volume, or molecule, contains one or more compounds, taken together, containing silicon covalently bonded to oxygen.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 34, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\* which is primarily compounds containing both silicon and oxygen, both aluminum and oxy-

gen, or combinations thereof, such as silica organosol\*, silica alcosol, talc, clay.

**SEE OR SEARCH CLASS:**

- 65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, anti-flocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, and subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

**80. The material is a silica particle having a distinct layer containing non-monovalent metal oxide (e.g., alumina coated silica sol):**

This subclass is indented under subclass 79. Subject matter in which said solid inorganic\* material\* is a silica particle which further has a distinct layer containing nonmonovalent metal oxide, such as alumina coated silica sol.

- (1) Note. "Nonmonovalent metal" excludes lithium, sodium, potassium, and rubidium.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 34, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\* which is primarily compounds containing both silicon and oxygen, both aluminum and oxygen, or combinations thereof, such as silica organosol\*, silica alcosol, talc, clay.

SEE OR SEARCH CLASS:

- 65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such

subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

**81. The material is substantially pure silica sol:**

This subclass is indented under subclass 79. Subject matter in which said solid inorganic\* material\* is substantially pure silica sol.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 34, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\* which is primarily compounds containing both silicon and oxygen, both aluminum and oxygen, or combinations thereof, such as silica organosol\*, silica alcosol, talc, and clay.

SEE OR SEARCH CLASS:

- 65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

**82. The silica is formed or grown by reaction of alkali silicate and non-siliceous inorganic acid (e.g., H<sub>2</sub>SO<sub>4</sub>):**

This subclass is indented under subclass 81. Subject matter in which said substantially pure silica is prepared by a reaction of alkali silicate and a non-siliceous inorganic\* acid, such as, sulfuric acid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 34, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\* which is primarily compounds containing both silicon and oxygen, both aluminum and oxygen, or combinations thereof, such as silica organosol\*, silica alcosol, talc, and clay.

SEE OR SEARCH CLASS:

- 65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.

**83. Ion exchange step occurs before or during growing or forming the sol:**

This subclass is indented under subclass 81. Subject matter in which said substantially pure silica is prepared by a process which employs an ion exchange step which occurs before or during growing or forming the sol.

- (1) Note. The ion-exchange step does not have to be recited in a claim, the disclosure may be relied upon.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 34, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\* which is primarily compounds containing both silicon and oxygen, both aluminum and oxygen, or combinations thereof, such as silica organosol\*, silica alcosol, talc, and clay.

SEE OR SEARCH CLASS:

- 65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.

**84. Ion-exchange step employed in post-treatment (e.g., purification):**

This subclass is indented under subclass 81. Subject matter in which said substantially pure silica is prepared by a process which employs an ion exchange step as a post-treatment of the formed silica particles, such as purification of the silica sol.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 34, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\* which is primarily compounds containing both silicon and oxygen, both aluminum and oxygen, or combinations thereof, such as silica organosol\*, silica alcosol, talc, and clay.
- 83, for a similar process which also employ an ion-exchange step preparatory to or part of growing or forming said silica.

SEE OR SEARCH CLASS:

- 65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.

**85. Gel forming step (e.g., peptize):**

This subclass is indented under subclass 81. Subject matter in which said substantially pure silica is prepared by a process which employs a gel forming step, such as, to peptize the reactants.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 34, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-



solid material\* which is primarily compounds containing both silicon and oxygen, both aluminum and oxygen, or combinations thereof, such as silica organosol\*, silica alcosol, talc, clay.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.

**86. Hydrolysis step or elemental silicon source (e.g., fumed silica):**

This subclass is indented under subclass 81. Subject matter in which said substantially pure silica is prepared by a process which employs a hydrolysis step or uses an elemental silicon source, such as making fumed silica.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

34, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\* which is primarily compounds containing both silicon and oxygen, both aluminum and oxygen, or combinations thereof, such as silica organosol\*, silica alcosol, talc, clay.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.

**87. Having colloid system stabilizing or preserving agent which is organic compound (e.g., deflocculant, antibacterial, esterification of unstable silicasols):**

This subclass is indented under subclass 81. Subject matter in which said colloid system of discontinuous substantially pure silica in aqueous continuous liquid phase further contains an organic\* compound as a colloid system stabilizing or preserving agent\*, such as, deflocculant, antibacterial.

(1) Note. Stabilization can be inferred whenever a dispersion containing alcohol is distilled because an esterification reaction will occur, which is known to stabilize colloid systems, such as the aqueous silicasols.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

34, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\* which is primarily compounds containing both silicon and oxygen, both aluminum and oxygen, or combinations thereof, such as silica organosol\*, silica alcosol, talc, clay.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.

**88. The material primarily contains compound containing both metal and oxygen (e.g., silver nitrate):**

This subclass is indented under subclass 78. Subject matter in which said solid inorganic\* material\* primarily contains one or more compounds, taken together, containing metal and oxygen, the metal and oxygen being bonded either directly or indirectly to each other, covalently or otherwise, such as silver nitrate.

(1) Note. "Primarily contains compound containing both metal and oxygen" means that 50% or more of the inorganic\* material\*, by weight, volume, or molecule, contains one or more compounds, taken together, containing both metal and oxygen.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

33+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\*.

## SEE OR SEARCH CLASS:

505, Superconductor Technology: Apparatus, Material, Process, for subject matter involving (a) superconductor technology above 30 K and (b) art collections involving superconductor technology; including apparatus, devices, materials, and processes involving such technology, subclass 165 for system, device, or component utilizing suspension of superconducting particulate material in liquid (e.g., seal, pump, etc.).

**89. The metal present in the greatest amount is yttrium, scandium, or rare earth (e.g., hydrated ceric dioxide):**

This subclass is indented under subclass 88. Subject matter in which the metal present in the greatest amount in the total of all compounds containing both metal and oxygen is yttrium, scandium, or rare earth, such as, dispersion of hydrated ceric dioxide.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

33+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\*.

## SEE OR SEARCH CLASS:

505, Superconductor Technology: Apparatus, Material, Process, for subject matter involving (a) superconductor technology above 30 K and (b) art collections involving superconductor technology; including apparatus, devices, materials, and processes involving such technology, subclass 165 for system, device, or component utilizing suspension of superconducting particulate material in liquid (e.g., seal, pump, etc.).

**90. The metal present in the greatest amount is titanium, zirconium, or hafnium:**

This subclass is indented under subclass 88. Subject matter in which the metal present in the greatest amount in the total of all compounds containing both metal and oxygen is titanium, zirconium, or hafnium.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

33+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\*.

**91. The metal present in the greatest amount is antimony, bismuth, or arsenic:**

This subclass is indented under subclass 88. Subject matter in which the metal present in the greatest amount in the total of all compounds containing both metal and oxygen is antimony, bismuth, or arsenic.

(1) Note. Arsenic is considered a metal for purposes of this subclass.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

33+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\*.

**92. The metal present in the greatest amount is tin, lead, or germanium (e.g., lead sulfate):**

This subclass is indented under subclass 88. Subject matter in which the metal present in the greatest amount in the total of all compounds containing both metal and oxygen is tin, lead, or germanium, such as, lead sulfate.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

33+, for colloid systems in which the continuous liquid phase is primarily organic and the discontinuous phase is primarily inorganic solid or semisolid material\*.

**93. The metal present in the greatest amount is aluminum:**

This subclass is indented under subclass 88. Subject matter in which the metal present in the greatest amount in the total of all compounds containing both metal and oxygen is aluminum.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

33+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\*.

**94. The aluminum material is fibrous or elongate:**

This subclass is indented under subclass 93. Subject matter in which said aluminum material\* is in the form of fibrous or elongate structure.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

33+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\*.

**95. The metal present in the greatest amount in the compounds is iron, nickel, or cobalt:**

This subclass is indented under subclass 88. Subject matter in which the metal present in the greatest amount in the total of all compounds containing both metal and oxygen is iron, nickel, or cobalt.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

33+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\*.

**96. The material primarily contains elemental selenium, tellurium, or sulfur, or compound thereof (e.g., zinc sulfide):**

This subclass is indented under subclass 78. Subject matter in which said discontinuous solid phase primarily inorganic\* material\* primarily contains elemental selenium, tellurium, or sulfur, or one or more compounds thereof, such as, zinc sulfide.

(1) Note. "Primarily contains elemental selenium, tellurium, or sulfur, or one or more compounds thereof" means that 50% or more of the solid inorganic\*

material\*, by weight, volume, molecule, or atom, contains elemental selenium, tellurium, or sulfur, or one or more compounds thereof, alone or in combination.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

33+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\*.

**97. The material primarily contains elemental platinum group metal, copper, silver, or gold, or compound thereof:**

This subclass is indented under subclass 78. Subject matter in which said discontinuous solid phase primarily inorganic\* material\* primarily contains elemental platinum group metal, copper, silver, or gold, or one or more compound thereof.

(1) Note. "Primarily contains elemental platinum group metal, copper, silver, or gold, or compound thereof" means that 50% or more of the solid inorganic\* material\*, by weight, volume, molecule, or atom, contains elemental platinum group metal, copper, silver, or gold, or one or more compounds thereof, alone or in combination.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

33+, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily inorganic\* solid or semi-solid material\*.

**98. CONTINUOUS OR SEMICONTINUOUS SOLID PHASE (I.E., SYSTEMS WHICH EXHIBIT PLASTICITY, ELASTICITY, OR RIGIDITY): COLLOID SYSTEMS; COMPOSITIONS CONTAINING AN AGENT FOR MAKING OR STABILIZING COLLOID SYSTEMS; PROCESSES OF MAKING OR STABILIZING COLLOID SYSTEMS; PROCESSES OF PREPARING THE COMPOSITIONS (E.G.,**

**GEL, PASTE, GELLED EMULSION, FLOC):**

This subclass is indented under the class definition. Subject matter which is a (1) colloid system having a continuous or semicontinuous solid phase, (2) composition containing an agent\* for making or stabilizing such a system, (3) process of making or stabilizing such a system, or (4) process of preparing a composition containing an agent\* for making or stabilizing such a system (i.e., systems which exhibit plasticity, elasticity, or rigidity); such as gel, paste, gelled emulsion, floc.

- (1) Note. A gel is defined as a solid or semi-solid colloid system formed of a solid continuous phase and a liquid phase (either discontinuous or continuous or mixed), often identified by its outward gelatinous appearance, and which exhibits properties of a solid such as plasticity, elasticity, or rigidity. Thus, for these colloid systems, the liquid phase need not be a 'dispersed' phase, rather it may be continuous. The gelling component (solid phase) is usually of the lipophilic type and present in concentrations of less than 10 percent. As defined for purposes of this and indented subclasses, this would exclude silica gels and aluminosilicate gels and other materials\* which are primarily solid and described as being particulate, microspheroidal, spheroidal, etc., or described with descriptive properties, terms, or expressions which indicates destruction of the two-phase system, such as, pore volume, pore diameter, surface area.
- (2) Note. Pastes are included here as semicontinuous solid phase materials\*. They exhibit one or more solid properties of plasticity, elasticity, or rigidity. The particles in the system appear to be weakly bonding so as to acquire solid or gel-like characteristics.
- (3) Note. The usual distinction between sols\* and gels\* is that sols\* are flowable and gels\* are not.
- (4) Note. For a gelled composition which is claimed or disclosed as having a function or utility provided for in the US

Patent Classification System, see Class 516 definitions, section II, subsections C and E especially.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 902, for an art collection of gelled emulsion.
- 905+, for a collection of art under the class definition which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition containing said agent\* and lacking both dispersant\* and dispersand\*.

**SEE OR SEARCH CLASS:**

- 34, Drying and Gas Vapor Contact with Solids, subclasses 302+ for processes under that class definition of treating a flowable material wherein the material is congealed, thickened, jelled, or stiffened in any way.
- 44, Fuel and Related Compositions, subclasses 265+ for a gelled composition to be used either as a fuel or as a carbonaceous reductant in a metallurgical process.
- 60, Power Plants, subclass 39.464 for reaction motor having means to produce combustion products wherein the fuel may be a solid, slurry, emulsion, dispersion, or suspension, subclass 252 for reaction motor (e.g., rockets) wherein the propellant is a gelatinous precipitate.
- 62, Refrigeration, subclass 54.1 for process or apparatus for storing a cryogen as a mixture of diverse phases, such as, a gel or colloid suspension.
- 65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.
- 71, Chemistry: Fertilizers, subclass 64.09 for processes directed to the preparation of fertilizers in form of gels and the produced plant fertilizing compositions.
- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid

- (particularly subclasses 64.41+ for a process or an apparatus for detecting or determining the composition of, a constituent of, or a property of a liquid or a liquid suspension of a solid and the determination is made by measuring or detecting the ability of the liquid to coagulate, to form a clot, or to form a stiffened or solid colloid-like mass (e.g., gel)).
- 95, Gas Separation: Processes, subclass 152 for contacting fluid mixture with a liquid and including coagulating or flocculating agent.
- 102, Ammunition and Explosives, subclass 365 for liquid or jelly containing incendiary apparatus or method of use.
- 149, Explosive and Thermic Compositions or Charges, appropriate subclasses for explosive and thermic compositions and methods of preparing or treating such compositions, where the latter are used to produce usable heat or flame or by-products resulting from the use of such compositions (e.g. smoke flares). See various subclasses based on active composition for explosive or thermic compositions which may be gels or pastes or may be intended to yield smoke as result of combustion (particularly subclasses 29+, 37+, and 78+), subclasses 17+ for compositions containing particulate material dispersed substantially entirely within a solidified or matrix medium and which are characterized by dispersed phase within a continuous phase, subclass 108.4 for smoke affecting composition (e.g., coloring), subclass 108.8 for compositions containing a stability or viscosity agent (e.g., gelling, thickening, thinning, liquefying, etc., agent, a stabilizer or unstabilizer (activator), a burning rate modifier), cross-reference art collection 110+ for compositions or processes reciting or disclosing a reference to a particular size or dimension of the particles of at least one of the ingredients or the size or dimension of all or part of the composition in particulate form, cross-reference art collection 117 for smoke generating or weather modifying composition with a resin, and cross-reference art collection 118 for composition containing a resin dissolved in the continuous phase of a gel.
- 166, Wells, subclasses 244.1+ for processes of treating or operating a well which may include gel forming or breaking in a well, which includes significantly claimed process steps of well treating or well operation. See also the notes and SEARCH CLASS references in Class 166, subclass 244.1.
- 209, Classifying, Separating, and Assorting Solids, subclass 5 for methods or apparatus for treatment of materials or items prior to their separation to facilitate the latter in which certain components of a mixture may be deflocculated or dispersed relatively to others or by which certain components may be flocculated (this subclass receives only methods and apparatus in which the deflocculation or coagulation is contributory to a subsequent separation of some components from others).
- 210, Liquid Purification or Separation, subclasses 702+ for processes in which a liquid is treated by a chemical or physical agent to cause a dissolved constituent to separate from the solvent or to cause a constituent, dispersed in such a finely divided state that it is not filterable or settleable, to agglomerate, coagulate, coalesce, or flocculate (e.g., subclasses 703+ for flotation using a specified precipitant, coagulant, or flocculant).
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252. See subclasses 186.1+ for compositions for bleaching by oxidation, or in other oxidation of extraneous substances, or in generating

- oxygen, subclass 194 for a composition which is designed to remove or bind water which may be in the form of a gel or which forms a gel, subclasses 634+ for radioactive compositions in the form of sol solution or gel.
- 264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 3.1+ for processes making gelled explosives which include a molding step or otherwise proper for this class.
- 361, Electricity: Electrical Systems and Devices, subclass 526 for solid electrolytic capacitor of paste or gel.
- 366, Agitating, subclasses 69+ for apparatus which may be used for working liquid into a gel. Processes which form colloid systems, such as emulsifying, gelling, or foaming, are proper for compositions Classes for the claimed specified use compositions, and for Class 516 for non-specified use compositions (generic).
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclass 1.25 for radionuclide containing composition which dissolves or elutes from solid or gel matrix, subclasses 469+ in which sustained or differential release type tablets, lozenges, or pills contain discrete soluble particles of the active ingredient are positioned or dispersed in a solid, generally insoluble matrix from which said particles are leached sequentially under conditions of use from the outside portions of the matrix inwardly, subclasses 76.2+ for non-body deodorizing substances which are evaporable, sublimable, or gas (e.g., deodorization of air, aerosol spray compositions, gels).
- 426, Food or Edible Material: Processes, Compositions, and Products, subclasses 531+ for per se products or processes of preparing or treating compositions involving chemical reaction by addition, combining diverse food material, or permanent additive (particularly subclasses 573+ for gels or gellable composition).
- 427, Coating Processes, subclass 246 for forming a foraminous product having a microporous coating by coagulating or jelling the coating.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclasses 199+ for films used for image forming and transfer (e.g., instant photography) which may include a gel, subclass 404 where a gel or web is used in a developer for nonradiation sensitive image processing, subclasses 495.1+ for film which may contain gel (e.g., gelatin).
- 436, Chemistry: Analytical and Immunological Testing, subclass 515 for tests involving diffusion or migration of antigen or antibody through a gel, such as immunoelectrophoresis.
- 501, Compositions: Ceramic, subclass 12 for glass or glass forming compositions which are made by a gel route.
- 502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, subclasses 233+ for forming a catalyst or precursor comprising forming silica gel (i.e., an amorphous form of hydrate silica, generally produced by precipitation or coagulation of a silica sol or decomposition of a silicate), subclass 405 for solid sorbent comprising inorganic gel composition, in which there is usually a metal or silicon oxide in relatively minor amount is distributed in suspension in water, appearing to be solid while the water constitutes as much as 95 to 99% of the mixture.
- 505, Superconductor Technology: Apparatus, Material, Process, subclass 440 for processes under the class definition of producing or treating high temperature ( $T_c > 30$  K) superconductor material or superconductor containing products or processes of producing or treating precursors thereof which utilizes a sol or gel at any stage, cross-reference art collection 735 for a process limited to the methods of making or treating high temperature ( $T_c > 30$  K) superconducting shaped material, article, or device which includes a sol-gel process.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wet-

- ting agents, cross-reference art collection 922+ for fracture fluids which may be gels.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated. This Class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be gel or paste. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to gel or paste colloid systems include: subclasses 133+ for composition for cleaning human skin (especially subclass 158 for cream, paste, or gel), subclasses 221+ for liquid, paste, or gel composition used in automatic dishwasher, subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclass 280 for gel or liquid composition for cleaning pile fabric or upholstery (e.g., carpet, rug), subclass 336 for gel, cream, or paste), subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)), subclasses 383+ for liquid, paste, or gel cleaning composition with halogen, nitrogen, oxygen, or phosphorus containing antiseptic or biocidal component, subclasses 395+ for cleaning composition with a scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), subclass 403 for gel or malleable (e.g., plastic-like) cleaning composition, subclass 404 for cream or paste cleaning composition, subclasses 535 for surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).
- 512, Perfume Compositions, subclass 2 for compositions which include a chemical compound whose sole purpose is to prevent chemical change, or to extend the life of the perfume by retarding evaporation of the perfume active ingredient, subclass 4 for non-liquid or encapsulated compositions, such as gels containing a perfume material
- 514, Drug, Bio-Affecting and Body Treating Compositions, subclasses 772+ for compositions which contain a designated nonbioactive organic compound (e.g., emulsifying polymers, gelatin), cross-reference art collections 936-975 which pertain to specifically disclosed carrier systems, physical form, or specified nonbioactive ingredient (particularly cross-reference art collection 944 for subject matter involving a gel form and containing specified ingredients to give a gel).
- 604, Surgery, subclass 368 for methods and apparatus comprising portable

receptor or material collecting means used to receive material discharge from the body and treatment of the body by employing material collectors or receptors which comprise an absorbent pad for external or internal application and supports therefor (e.g., catamenial devices, diapers, etc.) and which contain collagen or gelling material.

**99. The solid phase contains organic material:**

This subclass is indented under subclass 98. Subject matter in which the continuous or semicontinuous solid phase contains organic\* material\*, alone or in combination with inorganic\* material\*.

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain Nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

**SEE OR SEARCH CLASS:**

- 60, Power Plants, subclass 39.464 for reaction motor having means to produce combustion products wherein the fuel may be a solid, slurry, emulsion, dispersion, or suspension, subclass 252 for reaction motor (e.g., rockets) wherein the propellant is a gelatinous precipitate.
- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 64.41+ for a process or an apparatus for detecting or determining the composition of, a constituent of, or a property of a liquid or a liquid suspension of a solid and the determination is made by measuring or detecting the ability of the liquid to coagulate, to form a clot, or to form a stiffened or solid colloid-like mass (e.g., gel)).
- 102, Ammunition and Explosives, subclass 365 for liquid or jelly containing incendiary apparatus or method of use.

- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which are not elsewhere classified. See subclass 646 for inorganic settleable composition containing protein which sets or hardens when mixed with water or aqueous solutions, usually forming a hard, stone-like product, and forming foam, cellular, hollow, or porous material.

- 149, Explosive and Thermic Compositions or Charges, appropriate subclasses for explosive and thermic compositions and methods of preparing or treating such compositions, where the latter are used to produce usable heat or flame or by-products resulting from the use of such compositions (e.g., smoke flares). See various subclasses based on active composition for explosive or thermic compositions which may be gels or pastes or may be intended to yield smoke as result of combustion (particularly subclasses 29+, 37+, and 78+), subclasses 17+ for compositions containing particulate material dispersed substantially entirely within a solidified or matrix medium and which are characterized by dispersed phase within a continuous phase, subclass 108.4 for smoke affecting composition (e.g., coloring), subclass 108.8 for compositions containing a stability or viscosity agent (e.g., gelling, thickening, thinning, liquefying, etc., agent, a stabilizer or unstabilizer (activator), a burning rate modifier), cross-reference art collection 110+ for compositions or processes reciting or disclosing a reference to a particular size or dimension of the particles of at least one of the ingredients or the size or dimension of all or part of the composition in particulate form, cross-reference art collection 117 for smoke generating or weather modifying composition with a resin, and cross-reference art collection 118 for composition containing a resin dissolved in the continuous phase of a gel.



- 162, Paper Making and Fiber Liberation, subclass 187 for processes of forming an interfelted fibrous product from a hydrated or partially gelatinized fiber and the product per se.
- 166, Wells, subclasses 244.1+ for processes of treating or operating a well which may include gel forming or breaking in a well, which includes significantly claimed process steps of well treating or well operation. See also the notes and SEARCH CLASS references in Class 166 subclass 244.1 and in Class 507 definition.
- 204, Chemistry: Electrical and Wave Energy, subclass 414 for apparatus for electrolysis in analytical or testing system which uses a gel electrolyte, subclasses 450+ for processes of separating or purifying using electrophoresis or electro-osmosis (especially subclasses 456+ for processes of gel electrophoresis, subclass 514 for separation of hydrocarbon oil in an aqueous system (e.g., emulsion breaking)).
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclass 1.25 for radionuclide containing composition which dissolves or elutes from solid or gel matrix, subclasses 469+ in which sustained or differential release type tablets, lozenges, or pills contain discrete soluble particles of the active ingredient are positioned or dispersed in a solid, generally insoluble matrix from which said particles are leached sequentially under conditions of use from the outside portions of the matrix inwardly, subclasses 76.2+ for non-body deodorizing substances which are evaporable, sublimable, or gas (e.g., deodorization of air, aerosol spray compositions, gels).
- 426, Food or Edible Material: Processes, Compositions, and Products, subclasses 531+ for per se products or processes of preparing or treating compositions involving chemical reaction by addition, combining diverse food material, or permanent additive (particularly subclasses 573+ for gels or gellable composition).
- 427, Coating Processes, subclass 246 for forming a foraminous product having a microporous coating by coagulating or jelling the coating.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclasses 199+ for films used for image forming and transfer (e.g., instant photography) which may include a gel, subclass 404 where a gel or web is used in a developer for nonradiation sensitive image processing, subclasses 495.1+ for film which may contain gel (e.g., gelatin).
- 436, Chemistry: Analytical and Immunological Testing, subclass 515 for tests involving diffusion or migration of antigen or antibody through a gel, such as immunoelectrophoresis.
- 505, Superconductor Technology: Apparatus, Material, Process, subclass 440 for processes under the class definition of producing or treating high temperature ( $T_c > 30$  K) superconductor material or superconductor containing products or processes of producing or treating precursors thereof which utilizes a sol or gel at any stage, cross-reference art collection 735 for a process limited to the methods of making or treating high temperature ( $T_c > 30$  K) superconducting shaped material, article, or device which includes a sol-gel process.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, cross-reference art collection 922+ for fracture fluids which may be gels.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium

- clays, estersils, etc.) which may be surface-treated. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be gel or paste. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to gel or paste colloid systems include: subclasses 133+ for composition for cleaning human skin (especially subclass 158 for cream, paste, or gel), subclasses 221+ for liquid, paste, or gel composition used in automatic dishwasher, subclasses 276+ for cleaning compositions for textile material (e.g., laundry detergent) (particularly subclass 280 for gel or liquid composition for cleaning pile fabric or upholstery (e.g., carpet, rug), subclass 336 for gel, cream, or paste), subclasses 367+ for cleaning compositions with oxygen or halogen containing chemical bleach or oxidant component (particularly subclass 370 for liquid, paste, foam, or gel (e.g., slurry, aerosol composition or package)), subclasses 383+ for liquid, paste, or gel cleaning composition with halogen, nitrogen, oxygen, or phosphorus containing antiseptic or biocidal component, subclasses 395+ for cleaning composition with a scrubbing or scouring component (e.g., containing an abrasive, cream, paste, gel, gas-propelled, slurry), subclass 403 for gel or malleable (e.g., plastic-like) cleaning composition, subclass 404 for cream or paste cleaning composition, subclasses 535 for surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).
- 514, Drug, Bio-Affecting and Body Treating Compositions, subclasses 772+ for compositions which contain a designated nonbioactive organic compound (e.g., emulsifying polymers, gelatin), cross-reference art collections 936-975 which pertain to specifically disclosed carrier systems, physical form, or specified nonbioactive ingredient (particularly cross-reference art collection 944 for subject matter involving a gel form and containing specified ingredients to give a gel).
- 521, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclass 28 for a mixture of a synthetic ion exchange resin in gel form, subclasses 53+ for the gel of a porous synthetic resin.
- 523, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclasses 100 through 173, for nonporous synthetic polymeric gels with specified functions or uses.
- 524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, appropriate subclasses for synthetic polymeric gels, cross-reference art collection 916 for art collection disclosing hydrogel compositions, cross-reference art collection 922 for art collection disclosing flocculating, clarifying, or fining compositions.
- 528, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, cross-reference art collections 934+ for subject matter relating to recovery and physical processing of natural rubber latex (particularly cross-reference art collection 936 for coagulating).

530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, appropriate subclasses for colloid systems such as gel-like proteins; areas known to have documents related to colloid systems include: subclasses 354+ for gelatin, subclass 356 for collagen, subclasses 360+ for casein or caseinate, subclasses 362+ for albumin, subclasses 370+ for plant or yeast proteins, subclasses 380+ for blood proteins (particularly 381+ for blood coagulation factors and fibrin, e.g., thromboplastin).

**100. The organic material coats, impregnates, or surface modifies solid inorganic material (e.g., dextrin modified clay):**

This subclass is indented under subclass 99. Subject matter in which the organic\* material\* coats, impregnates, or surfaced modifies an inorganic\* material\*.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 98, for colloid systems of continuous or semicontinuous solid phase which does not have organic\* material\* in the solid phase, and also is of a solid material\* not provided for in subclasses 110, 111, or 112.
- 110, for colloid systems of continuous or semicontinuous solid phase in which the solid phase contains metal silicate or clay and which does not have organic\* material\* in the solid phase.
- 111, for colloid systems of continuous or semicontinuous solid phase in which the solid phase contains silica and which does not have organic\* material\* in the solid phase.
- 112, for colloid systems of continuous or semicontinuous solid phase in which the solid phase contains alumina and which does not have organic\* material\* in the solid phase.

**101. The organic material contains organic compound containing nitrogen, except if present solely as NH 4+ :**

This subclass is indented under subclass 100. Subject matter in which the organic\* material\* contains an organic\* compound which contains

nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 98, for colloid systems of continuous or semicontinuous solid phase which does not have organic\* material\* in the solid phase, and also is of a solid material\* not provided for in subclasses 110, 111, or 112.
- 102+, for colloid systems in which the solid phase contains an organic\* compound which contains Nitrogen (except if present solely as NH 4+), which doesn't coat, impregnate, or surface modify an inorganic\* material\*.
- 110, for colloid systems of continuous or semicontinuous solid phase in which the solid phase contains metal silicate or clay and which does not have organic\* material\* in the solid phase.
- 111, for colloid systems of continuous or semicontinuous solid phase in which the solid phase contains silica and which does not have organic\* material\* in the solid phase.
- 112, for colloid systems of continuous or semicontinuous solid phase in which the solid phase contains alumina and which does not have organic\* material\* in the solid phase.

**102. The organic material contains organic compound containing nitrogen, except if present solely as NH 4+:**

This subclass is indented under subclass 99. Subject matter in which the organic\* material\* contains an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from

plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 101, for colloid systems in which the solid phase contains an organic\* compound which contains nitrogen (except if present solely as  $\text{NH}_4^+$ ), which coats, impregnates, or surface modifies an inorganic\* material\*.

SEE OR SEARCH CLASS:

- 60, Power Plants, subclass 252 for reaction motor (e.g., rockets) wherein the propellant is a gelatinous precipitate.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclasses 199+ for films used for image forming and transfer (e.g., instant photography) which may include a gel, subclass 404 where a gel or web is used in a developer for nonradiation sensitive image processing, subclasses 495.1+ for film which may contain gel (e.g., gelatin).
- 530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, appropriate subclasses for colloid systems such as gel-like proteins; areas known to have documents related to colloid systems include: subclasses 354+ for gelatin, subclass 356 for collagen, subclasses 360+ for casein or caseinate, subclasses 362+ for albumin, subclasses 370+ for plant or yeast proteins, subclasses 380+ for blood proteins (particularly 381+ for blood coagulation factors and fibrin, e.g., thromboplastin).

- 103. The compound contains plural peptide linkages, i.e., compound formed from amino acids, natural or synthetic, by reaction of a carboxyl group of one such amino acid with an amino group of another same or different such amino acid:**

This subclass is indented under subclass 102. Subject matter in which the organic\* compound which contains Nitrogen contains plural

peptide linkages, i.e., compound formed from natural or synthetic amino acids.

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain Nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 101, for colloid systems in which the solid phase contains an organic\* compound which contains Nitrogen (except if present solely as  $\text{NH}_4^+$ ), which coats, impregnates, or surface modifies an inorganic\* material\*.

SEE OR SEARCH CLASS:

- 106, Compositions: Coating or Plastic, appropriate subclasses for coating or plastic compositions, and materials or ingredients used in the making of coating or plastic compositions, which are not elsewhere classified. subclass 646 for inorganic settleable composition containing protein which sets or hardens when mixed with water or aqueous solutions, usually forming a hard, stone-like product, and forming foam, cellular, hollow, or porous material.
- 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclasses 199+ for films used for image forming and transfer (e.g., instant photography) which may include a gel, subclass 404 where a gel or web is used in a developer for nonradiation sensitive image processing, subclasses 495.1+ for film which may contain gel (e.g., gelatin).
- 530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, appropriate subclasses for colloid systems such as gel-like proteins; areas known to have documents related to colloid systems include: subclasses 354+ for gelatin, subclass 356 for collagen, subclasses 360+ for casein or caseinate, subclasses 362+ for albumin, sub-

classes 370+ for plant or yeast proteins, subclasses 380+ for blood proteins (particularly 381+ for blood coagulation factors and fibrin, e.g., thromboplastin).

**104. The organic material contains organic compound containing oxygen:**

This subclass is indented under subclass 99. Subject matter in which the organic\* material\* contains an organic\* compound which contains Oxygen.

**105. The compound is a carbohydrate\* or carbohydrate-derivative\* (e.g., mono- or polysaccharide):**

This subclass is indented under subclass 104. Subject matter in which the organic\* compound which contains oxygen is a carbohydrate\* or carbohydrate-derivative\*, such as, monosaccharide or polysaccharide.

- (1) Note. Carbohydrates are compounds which are saccharides whose monomeric units are polyhydroxy mono-aldehydes or polyhydroxy mono-ketones, having the formula  $C_n(H_2O)_n$ , where n is five or six, or the corresponding cyclic hemiacetals thereof. Carbohydrate-derivatives maintain the carbon skeleton and the carbonyl function or hemi-acetal function of the saccharide.

**106. The compound is cellulose or derivative thereof (e.g., CMC):**

This subclass is indented under subclass 104. Subject matter in which the carbohydrate\* is cellulose or a derivative thereof, such as, carboxymethylcellulose (CMC).

- (1) Note. The cellulose may be derivatized so long as it satisfies the requirement for carbohydrate-derivative\*.

**107. The compound is gum or derivative thereof:**

This subclass is indented under subclass 104. Subject matter in which the carbohydrate\* is gum or a derivative thereof.

- (1) Note. The gum may be derivatized so long as it satisfies the requirement for carbohydrate-derivative\*.

- (2) Note. The term gum has acquired multiple meanings which are chemically unrelated to each other. The subject matter encompassed herein is that of the carbohydrate polymers occurring as exudates of various trees, shrubs, or algae. Examples include, guar, arabic, tragacanth, karaya. The gum may be natural or synthetic.

**108. The compound contains carboxylic acid ester group (e.g., glycerides):**

This subclass is indented under subclass 104. Subject matter in which the organic\* compound which contains oxygen contains carboxylic acid ester group, such as, glycerides.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 109, for similar colloid systems in which the organic\* oxygen containing compound contains carboxylic acid group or a salt thereof.

**109. The compound contains SYMBOL 45 \ "Symbol" \ 10C(=O)OH or salt thereof (e.g., calcium stearate):**

This subclass is indented under subclass 104. Subject matter in which the organic\* compound which contains oxygen contains the

- (1) Note. " SYMBOL 45 \ "Symbol" \ 10C(=O)OH group or salt thereof" does NOT include carboxylic acid esters ( SYMBOL 45 \ "Symbol" \ 10C(=O)OR where R is an organic\* group).

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 108, for similar colloid systems in which the organic\* oxygen containing compound contains carboxylic acid ester group.

**110. The solid phase contains metal silicate or clay (e.g., bentonite, kaolin):**

This subclass is indented under subclass 98. Subject matter in which the solid phase contains metal silicate or clay, such as, bentonite, kaolin.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 99+, for colloid systems in which the solid phase contains organic\* material\*, alone or in combination with metal silicate or clay.

SEE OR SEARCH CLASS:

- 65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.
- 501, Compositions: Ceramic, subclass 12 for glass or glass forming compositions which are made by a gel route.
- 502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, subclasses 233+ for forming a catalyst or precursor comprising forming silica gel (i.e., an amorphous form of hydrate silica, generally produced by precipitation or coagulation of a silica sol or decomposition of a silicate), subclass 405 for solid sorbent comprising inorganic gel composition, in which there is usually a metal or silicon oxide in relatively minor amount is distributed in suspension in water, appearing to be solid while the water constitutes as much as 95 to 99% of the mixture.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain silicon dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such

subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

**111. The solid phase contains silica (e.g., hydrated silicagel):**

This subclass is indented under subclass 98. Subject matter in which the solid phase contains silica, such as, hydrated silicagel.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 99+, for colloid systems in which the solid phase contains organic\* material\*, alone or in combination with silica.

SEE OR SEARCH CLASS:

- 65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.
- 501, Compositions: Ceramic, subclass 12 for glass or glass forming compositions which are made by a gel route.
- 502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, subclasses 233+ for forming a catalyst or precursor comprising forming silica gel (i.e., an amorphous form of hydrate silica, generally produced by precipitation or coagulation of a silica sol or decomposition of a silicate), subclass 405 for solid sorbent comprising inorganic gel composition, in which there is usually a metal or silicon oxide in relatively minor amount is distributed in suspension in water, appearing to be solid while the water constitutes as much as 95 to 99% of the mixture.
- 508, Solid Antifriction Devices, Material Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, appropriate subclasses for claimed or solely disclosed lubricants composed of suspension which may be colloid systems, see subclasses 136+ for compositions which are miscellaneous mineral oil compositions, or are lubricants or separants for moving solid surfaces, which contain sili-

con dioxide, silicic acid, orthosilicate, or metasilicate (e.g., clays, onium clays, estersils, etc.) which may be surface-treated. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

**112. The solid phase contains alumina (e.g., hydrated alumina-gel):**

This subclass is indented under subclass 98. Subject matter in which the solid phase contains alumina, such as, hydrated alumina-gel.

SEE OR SEARCH THIS CLASS, SUBCLASS:

99+, for colloid systems in which the solid phase contains organic\* material\*, alone or in combination with alumina.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclass 17.2 for processes of working or treating glass which includes a sol-gel route or liquid phase route procedure during any stage of working or treating glass.

501, Compositions: Ceramic, subclass 12 for glass or glass forming compositions which are made by a gel route.

502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, subclasses 233+ for forming a catalyst or precursor comprising forming silica gel (i.e., an amorphous form of hydrate silica, generally produced by precipitation or coagulation of a silica sol or decomposition of a silicate), subclass 405 for solid sorbent comprising inorganic gel composition, in which there is usually a metal or silicon oxide in relatively minor amount is distributed in suspension in water, appearing to be solid while the water constitutes as much as 95 to 99% of the mixture.

**113. COMPOSITIONS CONTAINING AN AGENT FOR BREAKING (RESOLVING)**

**OR INHIBITING COLLOID SYSTEMS; PROCESSES OF BREAKING (RESOLVING) OR INHIBITING COLLOID SYSTEMS (E.G., GEL BREAKING OR INHIBITING, COAGULATING, FLOCCULATING); PROCESSES OF PREPARING THE COMPOSITIONS:**

This subclass is indented under the class definition. Subject matter which is a (1) composition containing an agent\* for breaking (resolving) or inhibiting a colloid system, (2) process of breaking (resolving) or inhibiting such a system, by any means including chemically, physically, or energetically, for example, using contacted or added substance\*, material\*, or matrix, using shearing technique, using fixed bed, mesh, or screen, or using cooling or heating, or (3) process of preparing a composition containing an agent\* for breaking (resolving) or inhibiting such a system.

- (1) Note. Subject matter included in this and indented subclasses includes smoke clearing, defoaming, de-emulsifying, resolving emulsions or suspensions, flocculating colloid suspensions, and gel-breaking and compositions containing agents\* for accomplishing these objectives.
- (2) Note. As set forth in class definition (3) note, methods of breaking or inhibiting a colloid system which also thereby makes or stabilizes a (different) colloid system will be placed in the first occurring appropriate subclass in this class and cross-referenced to each other appropriate subclass.
- (3) Note. Agents\* for and methods of inhibiting or breaking gels (continuous solid phase colloid systems) or continuous liquid phase with discontinuous solid phase (solid particle sols, suspended solids) are not provided for in indented subclasses and hence are located in this subclass.
- (4) Note. Methods and agents\* for inhibiting or breaking colloid systems which are proper for this and indented subclasses include those which are characterized as physical, including those which do not involve the addition of solutes. For example, applying or remov-

ing heat, contacting with porous or particulate materials\*, or shearing techniques.

- (5) Note. Claims to methods for inhibiting or breaking which involve the use of a single compound are proper for placement in this and indented subclasses. Claims to agents\* consisting of single compounds, or to solid resins are properly placed in the appropriate compound or resin class, and no cross-reference is required to Class 516.
- (6) Note. A colloid system which intentionally contains a breaking (resolving) or inhibiting agent\* which is to be triggered by an event, such as heat, or light, or shear, in order for it to act to resolve or break the colloid system is proper for placement of a cross-reference in this and indented subclasses.

#### SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 53.01+ for liquid analysis or analysis of the suspension of solids in a liquid (particularly subclasses 64.41+ for a process or an apparatus for detecting or determining the composition of, a constituent of, or a property of a liquid or a liquid suspension of a solid and the determination is made by measuring or detecting the ability of the liquid to coagulate, to form a clot, or to form a stiffened or solid colloid-like mass (e.g., gel)).
- 162, Paper Making and Fiber Liberation; see subclasses 1+ for processes of liberation (especially subclasses 70+ for compositions specifically employed in or intended to be employed in the class provided for processes), subclasses 100+ for processes of depositing fibers from a liquid suspension thereof to form an interfelted fibrous product (paper), subclass 187 for processes of forming an interfelted fibrous product from a hydrated or partially gelatinized fiber and the product, per se.
- 166, Wells, subclasses 244.1+ for processes of treating or operating a well which may include gel forming or

breaking in a well, which includes significantly claimed process steps of well treating or well operation. See also the Notes and SEARCH CLASS references in Class 166, subclass 244.1.

- 204, Chemistry: Electrical and Wave Energy, subclasses 193+ for apparatus for electrical separation or purification of liquids, subclasses 450+ for processes of separating or purifying using electrophoresis or electro-osmosis, subclasses 554+ for processes (e.g., electrostatic separation of a liquid) involving (a) electrical (including simultaneous electrical and magnetic) separation or purification of a liquid, or (b) magnetic treatment, per se, when some effect other than mere separation is desired or produced (especially subclasses 563+ for process which involves breaking emulsion or dispersion by agglomerating or accreting suspended constituents in a predominantly hydrocarbon liquid, subclass 573 for process which involves breaking emulsion or dispersion by agglomerating or accreting suspended constituents in other than a predominantly hydrocarbon liquid).
- 208, Mineral Oils: Processes and Products, subclasses 177+ (see particularly subclass 263) for mere removal of a colloid system stabilizing agent\* from a mineral oil for the purpose of preventing formation of an emulsion, or colloid system, containing the mineral oil. Class 516 provides for breaking of emulsions of mineral oil when not combined with some other treatment of the mineral oil, i.e., Class 516 provides for effecting breaking or inhibiting by merely adding an agent\* for that purpose and permitting or causing separation (e.g., by settling).
- 209, Classifying, Separating, and Assorting Solids, subclass 5 for methods or apparatus for treatment of materials or items prior to their separation to facilitate the latter in which certain components of a mixture may be deflocculated or dispersed relatively to others or by which certain components may be flocculated (this sub-



- class receives only methods and apparatus in which the deflocculation or coagulation is contributory to a subsequent separation of some components from others).
- 210, Liquid Purification or Separation, provides for treating water or waste liquid, and when not more specifically provided for, for treating liquids in general or of any kind. Class 516 is the locus for the breaking of colloid systems generically claimed and provides for (a) the separation or purification of liquids, generally claimed, when performed by a Class 516 process, such as by breaking an emulsion, dispersion, or foam, and for such processes further including ancillary steps, such as, decanting, or passing through a separatory funnel, etc., or (b) processes in which recovery is intended of both water and another product. Class 210 provides for (a) processes which include a step of colloid system resolution of liquids, generally claimed, when combined with a step of separation of a diverse component, unless that step is also a Class 516 step (i.e., multiple Class 516 steps are proper for placement in Class 516), or (b) a step of colloid system breaking, per se, for the purpose of obtaining water, wherein the water may be intended for use or intended to be made suitable for disposal, thus, decontaminating of sewage waste water to be dumped into the ocean using an emulsion breaking step is proper for Class 210. See subclasses 634+ for liquid/liquid solvent or colloid dispersion extraction, subclasses 702+ for processes in which a liquid is treated by a chemical or physical agent to cause a dissolved constituent to separate from the solvent or to cause a constituent, dispersed in such a finely divided state that it is not filterable or settleable, to agglomerate, coagulate, coalesce, or flocculate (e.g., subclasses 703+ for flotation using a specified precipitant, coagulant, or flocculant, and subclass 708 for including emulsion breaking), cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).
- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252. See subclasses 175+ for compositions for treating water to soften or purify it, to precipitate impurities in it, or to inhibit formation of scale or incrustation in steam boilers or other water containers,
- 435, Chemistry: Molecular Biology and Microbiology, methods for defoaming or foam inhibiting of fermentations which include more than a nominal fermentation step are proper for Class 435, even though a Class 516 composition or step may be present.
- 436, Chemistry: Analytical and Immunological Testing, subclass 18 for compositions, such as anticoagulant containing, which are used to mimic or quantify the effect, in a chemical test procedure, of another chemical composition, or to stabilize, preserve or otherwise prepare a sample for a chemical test and the processes of use of such materials preparatory to a chemical test procedure.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, cross-reference art collection 921 for well treating composition intended to break an emulsion or gel or to uncrosslink a polymer.
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject mat-

ter. See various subclasses in the 520 series of classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.

524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, cross-reference art collection 922 for flocculating, clarifying, or fining compositions.

528, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, cross-reference art collections 934+ for subject matter relating to recovery and physical processing of natural rubber latex (particularly cross-reference art collection 936 for coagulating).

530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, appropriate subclasses for breaking suspended solid colloid systems such as proteins; areas known to have documents related to colloid systems or wetting agents include: subclasses 354+ for gelatin, subclass 356 for collagen, subclasses 360+ for casein or caseinate, subclasses 362+ for albumin, subclasses 370+ for plant or yeast proteins, subclasses 380+ for blood proteins (particularly 381+ for blood coagulation factors and fibrin, e.g., thromboplastin).

**114. Continuous gas or vapor phase colloid system (e.g., fog dispelling, dust or contrail suppressing):**

This subclass is indented under subclass 113. Subject matter in which the colloid system subject to breaking (resolving) or inhibiting is a continuous gas or vapor phase, such as, fog dispelling, dust suppressing, contrail suppressing.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

113, for similar subject matter related to breaking (resolving) or inhibiting of colloid systems other than foams (as provided for in subclass 115+) or emulsions (as provided for in subclasses 135+), such as, with a continuous liquid phase and a discontinuous

solid phase (solid particle sols) or with a continuous solid phase (gels).

115+, for similar subject matter related to breaking (resolving) or inhibiting of colloid systems with a continuous liquid phase and a discontinuous gas or vapor phase (foams).

135+, for similar subject matter related to breaking (resolving) or inhibiting of colloid systems with a continuous liquid phase and a discontinuous liquid phase (emulsions).

**SEE OR SEARCH CLASS:**

95, Gas Separation: Processes, subclasses 57+ for processes using electric or electrostatic field (e.g., electrostatic precipitation, etc.). Also see other entries in this SEARCH CLASS.

239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 2.1+ for processes including spraying or dispersing and intended for weather control or modification including fog clearing or making, snow making, rain making (i.e., either (a) to wet a surface or (b) to precipitate moisture from the atmosphere).

435, Chemistry: Molecular Biology and Microbiology, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 283.1+ for Class apparatus.

454, Ventilation, cross-reference art collection 901, for fog dispeller, i.e., comprising means for eliminating or dispersing cloud-like, condensed water vapor which is positioned close to a ground surface.

510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, subclass 216 for compositions facilitating sweeping uncarpeted floors by reducing the amount of dust that becomes airborne. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitu-

tion (i.e., as though it has no colloid system characteristic).

**115. Continuous liquid phase colloid system and discontinuous gas or vapor phase (i.e., foam):**

This subclass is indented under subclass 113. Subject matter in which the colloid system subject to breaking (resolving) or inhibiting is a continuous liquid phase with a discontinuous gas or vapor phase (i.e., foam).

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 113, for similar subject matter related to breaking (resolving) or inhibiting of colloid systems other than smokes or fogs (as provided for in subclass 114) or emulsions (as provided for in subclasses 135+), such as, with a continuous liquid phase and a discontinuous solid phase (solid particle sols) or with a continuous solid phase (gels).
- 114, for similar subject matter related to breaking (resolving) or inhibiting of colloid systems with a continuous gas or vapor phase (fogs, smokes).
- 135+, for similar subject matter related to breaking (resolving) or inhibiting of colloid systems with a continuous liquid phase and a discontinuous liquid phase (emulsions).
- 904, for a collection of art which discloses foam breaking or inhibiting subject matter in the context of fermentation technology.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 19.01+ for a process or an apparatus for determining the nature or amount of gas in a substance other than gas.
- 95, Gas Separation: Processes, subclasses 57+ for processes using electric or electrostatic field (e.g., electrostatic precipitation, etc.), subclass 150 for contacting fluid mixture with a liquid and including foaming of liquid to aid in the separation, subclass 155 for contacting fluid mixture with a liquid and including defoaming or antifoaming agent, subclass 157 for contacting fluid mixture with a liquid to degasify and including defoaming, subclasses

241+ for processes of degasification of a liquid (subclass 242 for defoaming and subclass 253 for emulsion breaking or multiple liquid separating).

- 137, Fluid Handling, subclasses 170.1+ for apparatus for foam control in gas charged liquids.
- 184, Lubrication, subclass 6.23 for devices which include means to destroy or remove gas or vapor bubbles dispersed in the lubricant.
- 201, Distillation: Processes, Thermolytic, subclass 9 for process including a step of surface treating solid carbonaceous material to reduce or prevent agglomerating or foaming or swelling during distillation.
- 202, Distillation: Apparatus, subclass 264 for apparatus for breaking foam during distillation.
- 203, Distillation: Processes, Separatory, subclass 20 for processes under that Class definition including defoaming or inhibiting foam.
- 209, Classifying, Separating, and Assorting Solids, subclasses 163+ for methods and means wherein some material is caused to adhere selectively (i.e., to some constituents and not to others) which so lightens the material constituents to which it is attached as to cause them to float on the liquid, while the other constituents are not floated (e.g. bubbles are caused to attach to some components of a material or mixture of solid materials and not to others, the components to which the bubbles are attached being caused thereby to float on the surface of the liquid).
- 426, Food or Edible Material: Processes, Compositions, and Products, subclass 329 wherein a food foam is protected against deterioration, or wherein a food is protected against undesirable foam formation by contact with a change inhibiting chemical agent other than an antioxygen agent.
- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in

a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR 184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.

**116. The agent contains both organic and inorganic (except water) materials (e.g., amine hydrophobized silica):**

This subclass is indented under subclass 115. Subject matter in which the breaking (resolving) or inhibiting agent\* contains both organic\* and inorganic\* (except water) materials\*, such as, amine hydrophobized silica.

- (1) Note. Included in this and indented subclasses are the inorganic\* particles which are treated or coated with an organic\* compound, by reaction or otherwise.
- (2) Note. Indented subclasses have only been provided for organic\* materials\* containing an organic\* compound containing Silicon, hence compound such as amine hydrophobized silica are proper for this subclass.
- (3) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

- (4) Note. "Inorganic\* (except water)" means water is not considered in the assessment of the composition of the inorganic\* material\*.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 139+, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains material\* different from the primary components of both liquid phases of the colloid system, other than as provided for in subclasses 136+ (using an agent\* which is solid surface functioning), and other than as provided for in subclass 140 (physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*)); particularly subclass 141 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which is only inorganic\*, and subclass 142 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which contains both organic\* material\* and inorganic\* material\*.

**117. The agent contains organic compound containing silicon (e.g., siloxane hydrophobized silica):**

This subclass is indented under subclass 116. Subject matter in which the breaking (resolving) or inhibiting agent\* contains an organic\* compound which contains silicon, such as, siloxane hydrophobized silica.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 139+, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains material\* different from the primary components of both liquid phases of the colloid system, other than as provided for in subclasses 136+ (using an agent\* which is solid surface functioning), and other than as provided for in subclass 140 (physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*)); particularly subclass 141 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which is only inorganic\*, and subclass 142 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which contains both organic\* material\* and inorganic\* material\*.

**118. The compound is polysiloxane which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 117. Subject matter in which the organic\* compound which contains silicon is polysiloxane which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 139+, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains material\* different from the primary components of both liquid phases of the colloid system, other than as provided for in subclasses 136+ (using an agent\* which is solid surface functioning), and other than as provided for in subclass 140 (physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*)); particularly subclass 141 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which is only inorganic\*, and subclass 142 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which contains both organic\* material\* and inorganic\* material\*.

**119. The compound contains nitrogen, except if present solely as NH 4+ (e.g., organosilazane treated silica):**

This subclass is indented under subclass 117. Subject matter in which the organic\* compound which contains silicon also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+, such as, organosilazane treated silica.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 137, for similar subject matter related to breaking (resolving) or inhibiting of

- emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 139+, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains material\* different from the primary components of both liquid phases of the colloid system, other than as provided for in subclasses 136+ (using an agent\* which is solid surface functioning), and other than as provided for in subclass 140 (physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*)); particularly subclass 141 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which is only inorganic\*, and subclass 142 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which contains both organic\* material\* and inorganic\* material\*.

**120. The agent contains organosilane coated or treated solid particle:**

This subclass is indented under subclass 117. Subject matter in which the organic\* compound which contains silicon is a solid particle which is coated or treated with an organosilane compound.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 139+, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains material\* different from the pri-

mary components of both liquid phases of the colloid system, other than as provided for in subclasses 136+ (using an agent\* which is solid surface functioning), and other than as provided for in subclass 140 (physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*)); particularly subclass 141 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which is only inorganic\*, and subclass 142 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which contains both organic\* material\* and inorganic\* material\*.

**121. The agent contains primarily aqueous continuous phase, i.e., water carrier:**

This subclass is indented under subclass 117. Subject matter in which the breaking (resolving) or inhibiting agent\* contains a primarily aqueous continuous phase, i.e., water carrier, in addition to the organic\* compound which contains silicon.

- (1) Note. "Primarily aqueous" means that 50% or more of the continuous liquid phase is aqueous, by weight, volume, or molecule, on a solids-free basis, i.e., not including any dissolved or suspended solids.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material and an organic\* material.
- 139+, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains material\* different from the pri-

mary components of both liquid phases of the colloid system, other than as provided for in subclasses 136+ (using an agent\* which is solid surface functioning), and other than as provided for in subclass 140 (physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*)); particularly subclass 141 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which is only inorganic\*, and subclass 142 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which contains both organic\* material\* and inorganic\* material\*.

**122. The agent contains inorganic (except water) material:**

This subclass is indented under subclass 115. Subject matter in which the breaking (resolving) or inhibiting agent\* contains an inorganic\* (except water) material\*.

- (1) Note. This subclass provides for subject matter in which the agent\* doesn't contain any organic\* material\*.
- (2) Note. "Inorganic\* (except water)" means water is not considered in the assessment of the composition of the inorganic\* material\*.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 116+, for similar subject matter related to breaking (resolving) or inhibiting of foams using an agent\* which contains both an organic\* and an inorganic\* material\*.
- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only

organic\* or in which the nature of the material\* is indeterminable.

- 138, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which contains only inorganic\* material\*.

- 139+, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains material\* different from the primary components of both liquid phases of the colloid system, other than as provided for in subclasses 136+ (using an agent\* which is solid surface functioning), and other than as provided for in subclass 140 (physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*)); particularly subclass 141 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which is only inorganic\*, and subclass 142 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which contains both organic\* material\* and inorganic\* material\*.

**123. The agent contains organic compound containing silicon (e.g., alkylpolysiloxane oil):**

This subclass is indented under subclass 115. Subject matter in which the breaking (resolving) or inhibiting agent\* contains an organic\* compound which contains silicon, such as, alkylpolysiloxane oil.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.

- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 144, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 140), and in which the agent\* doesn't contain both an inorganic\* material\* and an organic\* material\* (as provided for in subclass 142).

**124. The compound is polysiloxane which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 123. Subject matter in which the organic\* compound which contains silicon is polysiloxane which contains repeating -(OC nH 2n)-, (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 123, for similar subject matter wherein monoether derivatives are used.
- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only

organic\* or in which the nature of the material\* is indeterminable.

- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 144, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 140), and in which the agent\* doesn't contain both an inorganic\* material\* and an organic\* material\* (as provided for in subclass 142).

**125. The agent contains organic compound containing phosphorus (e.g., lecithin):**

This subclass is indented under subclass 115. Subject matter in which the breaking (resolving) or inhibiting agent\* contains an organic\* compound which contains phosphorus, such as, lecithin.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.
- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.



- 145, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 140), and in which the agent\* doesn't contain both an inorganic\* material\* and an organic\* material\* (as provided for in subclass 142).
- 126. The agent contains organic compound containing sulfoxy\* (e.g., organo-sulfone, -sulfate, -sulfonate):**  
This subclass is indented under subclass 115. Subject matter in which the breaking (resolving) or inhibiting agent\* contains an organic\* compound which contains sulfoxy\*, such as, organo-sulfone, -sulfate, -sulfonate.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.
- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 146+, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 142).
- 127. Nitrogen covalently bound to the sulfur of the sulfoxy\*:**  
This subclass is indented under subclass 126. Subject matter in which the organic\* compound contains sulfoxy\* in which nitrogen is covalently bonded to the sulfur of the sulfoxy\*.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.
- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 148+, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 142).

140), and in which the agent\* doesn't contain both an inorganic\* material\* and an organic\* material\* (as provided for in subclass 142).

**128. The agent contains organic compound containing nitrogen, except if present solely as NH 4+:**

This subclass is indented under subclass 115. Subject matter in which the breaking (resolving) or inhibiting agent\* contains an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.
- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 161+, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing

agent\*) (as provided for in subclass 140), and in which the agent\* doesn't contain both an inorganic\* material\* and an organic\* material\* (as provided for in subclass 142).

**129. The compound contains oxygen:**

This subclass is indented under subclass 128. Subject matter in which the organic\* compound which contains nitrogen also contains oxygen.

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.
- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 161+, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 140), and in which the agent\* doesn't contain both an inorganic\* material\*

and an organic\* material\* (as provided for in subclass 142).

**130. The compound contains -C(=O)NHH where substitution may be made for the hydrogen:**

This subclass is indented under subclass 129. Subject matter in which the organic\* compound contains -C(=O)NHH group where substitution may be made for the hydrogen.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.
- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 161+, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 140), and in which the agent\* doesn't contain both an inorganic\* material\* and an organic\* material\* (as provided for in subclass 142).

**131. The compound contains plural -C(=O)NHH where substitution may be made for the hydrogen:**

This subclass is indented under subclass 130. Subject matter in which the organic\* compound contains plural (two or more) -

C(=O)NHH group where substitution may be made for the hydrogen.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.
- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 161+, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 140), and in which the agent\* doesn't contain both an inorganic\* material\* and an organic\* material\* (as provided for in subclass 142).

SEE OR SEARCH CLASS:

- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed

(especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.

- 935, Genetic Engineering: Recombinant DNA Technology, Hybrid or Fused Cell Technology, and Related Manipulations of Nucleic Acids, subclasses 59+ for methods of using of genetically engineered cells, e.g., oil spill cleanup which may involve emulsion or foam making or breaking.

**132. The agent contains organic compound containing oxygen:**

This subclass is indented under subclass 115. Subject matter in which the breaking (resolving) or inhibiting agent\* contains an organic\* compound which contains oxygen.

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.
- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 181+, for similar subject matter related to breaking (resolving) or inhibiting of

aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 140), and in which the agent\* doesn't contain both an inorganic\* material\* and an organic\* material\* (as provided for in subclass 142).

**133. The compound contains carboxylic acid ester group (e.g., natural (glyceride) oil):**

This subclass is indented under subclass 132. Subject matter in which the organic\* compound contains an organic\* carboxylic acid ester, such as, natural (glyceride) oil.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.
- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 181+, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in sub-

classes 136+), and is other than physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 140), and in which the agent\* doesn't contain both an inorganic\* material\* and an organic\* material\* (as provided for in subclass 142).

**134. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 132. Subject matter in which the organic\* compound contains repeating -(OC nH 2n)-, (i.e., repeating unsubstituted oxyalkylene, bonded directly to each other).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\* which is only organic\* or in which the nature of the material\* is indeterminable.
- 137, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains a solid material\*, in which the material\* contains both an inorganic\* material\* and an organic\* material\*.
- 181+, for similar subject matter related to breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions (using an agent\* which contains material\* different from the primary components of both liquid phases as required by hierarchically superior subclass 139), and in which the agent\* is other than solid surface functioning (as provided for in subclasses 136+), and is other than physically or chemically dissolving

binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*) (as provided for in subclass 140), and in which the agent\* doesn't contain both an inorganic\* material\* and an organic\* material\* (as provided for in subclass 142).

**135. Continuous liquid phase colloid system and discontinuous liquid phase (e.g., breaking an emulsion):**

This subclass is indented under subclass 113. Subject matter in which the colloid system subject to breaking (resolving) or inhibiting is a continuous liquid phase with a discontinuous liquid phase, such as, an emulsion.

- (1) Note. Dilution performed only with a material\* which is the same as the primary component of one of the two liquid phases in order to effect breaking (resolving) or inhibiting of a colloid system and not combined with a step of vaporizing, heating, or cooling (as provided for below) and not combined with a step of centrifuging, mechanical shocking, or specified agitating (as provided for below) is proper for this subclass, there being no indented subclass providing for this subject matter. Dilution combined with adding material\*, dissimilar from the primary component of either of the two liquid phases, for breaking (resolving) or inhibiting of a colloid system (such as using the diluent as a solvent/carrier for the dissimilar agent\*), is located with the agent\* in a hereinunder indented subclass; see SEARCH THIS CLASS, SUBCLASS for some suggestions.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 113, for similar subject matter related to breaking (resolving) or inhibiting of colloid systems other than smokes or fogs (as provided for in subclass 114) or foams (as provided for in subclasses 115+), such as, with a continuous liquid phase and a discontinuous solid phase (solid particle sols) or with a continuous solid phase (gels).

- 114, for similar subject matter related to breaking (resolving) or inhibiting of colloid systems with a continuous gas or vapor phase (fogs, smokes).
- 115+, for similar subject matter related to breaking (resolving) or inhibiting of colloid systems with a continuous liquid phase and a discontinuous gas or vapor phase (foams).
- 136+, for subject matter in which the breaking (resolving) or inhibiting agent\* contains a solid surface functioning material\*, i.e., solid adsorbent, absorbent, or differential adherence surface, such as, filter media, sharp edged particles.
- 139+, for subject matter related to breaking (resolving) or inhibiting of emulsions using an added material\* dissimilar from the primary component of both liquid phases.
- 194+, for subject matter related to breaking (resolving) or inhibiting of emulsions using vaporizing, heating, or cooling, and without using an added material\* dissimilar from the primary component of both liquid phases.
- 197, for subject matter related to breaking (resolving) or inhibiting of emulsions using centrifuging, mechanical shocking, or specified agitating, and without using an added material\* dissimilar from the primary component of both liquid phases.

**SEE OR SEARCH CLASS:**

- 95, Gas Separation: Processes, subclasses 57+ for processes using electric or electrostatic field (e.g., electrostatic precipitation, etc.), subclasses 241+ for processes of degasification of a liquid (subclass 242 for defoaming and subclass 253 for emulsion breaking or multiple liquid separating).
- 166, Wells, subclasses 244.1+ for processes of preventing emulsification or of breaking emulsions in a well, which includes significantly claimed process steps of well treating or well operation. See also the Notes and SEARCH CLASS references in Class 166 subclass 244.1 and in Class 507 Definition.

- 204, Chemistry: Electrical and Wave Energy, subclasses 193+ for apparatus for electrical separation or purification of liquids, subclasses 450+ for processes of separating or purifying using electrophoresis or electro-osmosis (especially subclasses 456+ for processes of gel electrophoresis, subclass 514 for separation of hydrocarbon oil in an aqueous system (e.g., emulsion breaking)), subclasses 554+ for processes (e.g., electrostatic separation of a liquid) involving (a) electrical (including simultaneous electrical and magnetic) separation or purification of a liquid, or (b) magnetic treatment, per se, when some effect other than mere separation is desired or produced (especially subclasses 563+ for process which involves breaking emulsion or dispersion by agglomerating or accreting suspended constituents in a predominantly hydrocarbon liquid, subclass 573 for process which involves breaking emulsion or dispersion by agglomerating or accreting suspended constituents in other than a predominantly hydrocarbon liquid).
- 208, Mineral Oils: Processes and Products, subclasses 39+ for processes of removing water from asphalts, tars, pitches, or resins, subclasses 177+ for mere removal of a colloid system stabilizing agent from a mineral oil for the purpose of preventing formation of an emulsion or colloid system containing the mineral oil (particularly subclasses 179+ for processes of removing water from used mineral oils, subclasses 187+ for the separation of water emulsified with the oil, subclass 263 for removing undesirable organic acids or phenolic components from mineral oils. Class 516 provides for breaking of emulsions of mineral oil when not combined with some other treatment of the mineral oil, i.e., Class 516 provides for effecting breaking or inhibiting by merely adding an agent\* for that purpose and permitting or causing separation (e.g., by settling).

- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, cross-reference art collection 921 for well treating composition intended to break an emulsion or gel or to uncrosslink a polymer.
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses in the 520 series of classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.
- 524, Synthetic Resins or Natural Rubbers-- Part of the Class 520 Series, cross-reference art collection 922 for flocculating, clarifying, or fining compositions.
- 528, Synthetic Resins or Natural Rubbers-- Part of the Class 520 Series, cross-reference art collections 934+ for subject matter relating to recovery and physical processing of natural rubber latex (particularly cross-reference art collection 936 for coagulating).
- 136. Breaking (resolving) or inhibiting occurs on the surface of a solid agent (e.g., adsorbent, absorbent, differential adherence surface, filter, sharp edged particles):**  
This subclass is indented under subclass 113. Subject matter in which the breaking (resolving) or inhibiting agent\* occurs on the surface of a solid material\*, such as, solid adsorbent, absorbent, differential adherence surface, filter media, sharp edged particles, for example processes which describe the phenomenon of coalescence occurring on the surface of the solid agent.
- (1) Note. Included here are documents disclosing solids comprising filter beds, screens, particulates (such as sand), adsorbents, and absorbents, whether they are described as acting physically or chemically (bonding), such as by differential wetting, hydrogen bonding, etc.
  - (2) Note. Not included here are documents merely disclosing typical apparatus such as vessel, container, pipe walls, agitator vanes, etc., without a description of coalescence upon the apparatus surfaces.
  - (3) Note. Not included here are documents merely disclosing centrifuging, mechanical shocking, or specified agitating, without a description of coalescence upon the apparatus surfaces. Such processes typically disclose coalescence among the dispersed phase droplets themselves.
  - (4) Note. Solid material\* which is entirely organic\* material\* or the nature of which is indeterminable is proper for placement in this subclass since no indented subclass provides for that subject matter.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

135, for dilution performed only with a material\* which is the same as the primary component of one of the two liquid phase in order to effect breaking (resolving) or inhibiting of a colloid system, and not combined with a step of vaporizing, heating, or cooling (as provided for subclasses 194+, below) and not combined with a step of centrifuging, mechanical shocking, or specified agitating (as provided for in subclass 197, below), there being no indented subclass providing for this subject matter.

139+, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains material\* different from the primary components of both liquid phases of the colloid system, other than as provided for in subclasses 136+ (using an agent\* which is solid surface functioning), and other than as provided for in subclass 140 (physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*)); particularly subclass 141 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which is only inorganic\*, and subclass 142 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which contains both organic\* material\* and inorganic\* material\*.

194+, for subject matter related to breaking (resolving) or inhibiting of emulsions using vaporizing, heating, or cooling, and without using an added material\* dissimilar from the primary component of both liquid phases.

197, for subject matter related to breaking (resolving) or inhibiting of emulsions

using centrifuging, mechanical shocking, or specified agitating, and without using an added material\* dissimilar from the primary component of both liquid phases.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).

**137. The agent contains both organic and inorganic (except water) material:**

This subclass is indented under subclass 136. Subject matter in which the solid material\* contains both organic\* material\* and inorganic\* (except water) material\*.

- (1) Note. Included here are documents disclosing solids comprising filter beds, screens, particulates (such as sand), adsorbents, and absorbents, whether they are described as acting physically or chemically (bonding), such as by differential wetting, hydrogen bonding, etc.
- (2) Note. Not included here are documents merely disclosing typical apparatus such as vessel, container, pipe walls, agitator vanes, etc., without a description of coalescence upon the apparatus surfaces.
- (3) Note. Not included here are documents merely disclosing centrifuging, mechanical shocking, or specified agitating, without a description of coalescence upon the apparatus surfaces. Such processes typically disclose coalescence among the dispersed phase droplets themselves.
- (4) Note. An inorganic\* material\*, such as sand, treated or coated with an organic\* material\*, such as siloxane, satisfies the scope of this definition and is proper for placement in this subclass.



- (5) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.
- (6) Note. "Inorganic\* (except water)" means water is not considered in the assessment of the composition of the inorganic\* material\*.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 195, for subject matter related to breaking (resolving) or inhibiting of emulsions using vaporizing, heating, or cooling combined with or simultaneous with centrifuging, mechanical shocking, or specified agitating, and without using an added material\* dissimilar from the primary component of both liquid phases.
- 197, for subject matter related to breaking (resolving) or inhibiting of emulsions using centrifuging, mechanical shocking, or specified agitating, and without using an added material\* dissimilar from the primary component of both liquid phases.

SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).

**138. The agent contains inorganic (except water) material (e.g., metal screen, CaCO<sub>3</sub>, glass, clay, diatomaceous earth, sand, gravel, alum):**

This subclass is indented under subclass 136. Subject matter in which the solid material\* contains inorganic\* (except water) material\* only, such as, metal screen, CaCO<sub>3</sub>, glass, clay, diatomaceous earth, sand, gravel, alum.

- (1) Note. Included here are documents disclosing solids comprising filter beds, screens, particulates (such as sand), adsorbents, and absorbents, whether they are described as acting physically or chemically (bonding), such as by differential wetting, hydrogen bonding, etc.
- (2) Note. Not included here are documents merely disclosing typical apparatus such as vessel, container, pipe walls, agitator vanes, etc., without a description of coalescence upon the apparatus surfaces.
- (3) Note. Not included here are documents merely disclosing centrifuging, mechanical shocking, or specified agitating, without a description of coalescence upon the apparatus surfaces. Such processes typically disclose coalescence among the dispersed phase droplets themselves.
- (4) Note. "Inorganic\* (except water)" means water is not considered in the assessment of the composition of the inorganic\* material\*.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 195, for subject matter related to breaking (resolving) or inhibiting of emulsions using vaporizing, heating, or cooling combined with or simultaneous with centrifuging, mechanical shocking, or specified agitating, and without using an added material\* dissimilar from the primary component of both liquid phases.
- 197, for subject matter related to breaking (resolving) or inhibiting of emulsions using centrifuging, mechanical shocking, or specified agitating, and without using an added material\* dissimilar from the primary component of both liquid phases.

SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-

reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).

**139. The agent contains material which is different from the primary components of both liquid phases of the emulsion colloid system (i.e., more than only diluting):**

This subclass is indented under subclass 135. Subject matter in which the breaking (resolving) or inhibiting agent\* contains an active material\* which is different from the primary components of both liquid phases of the emulsion colloid system (i.e., more than only diluting).

- (1) Note. The agent\* may include material\* which is the same as the primary components of either or both of the liquid phases of the emulsion, but it must further contain material\* which is dissimilar and which is active to effect the breaking (resolving) or inhibiting (i.e., colloid system breaking or inhibiting agent\*).

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 135, for dilution performed only with a material\* which is the same as the primary component of one of the two liquid phase in order to effect breaking (resolving) or inhibiting of a colloid system, and not combined with a step of vaporizing, heating, or cooling (as provided for subclasses 194+, below) and not combined with a step of centrifuging, mechanical shocking, or specified agitating (as provided for in subclass 197, below), there being no indented subclass providing for this subject matter.
- 136+, for subject matter in which the breaking (resolving) or inhibiting agent\* contains a solid surface functioning material\*, i.e., solid adsorbent, absorbent, or differential adherence surface, such as, filter media, sharp edged particles.
- 194+, for subject matter related to breaking (resolving) or inhibiting of emulsions using vaporizing, heating, or cooling, and without using an added material\*

dissimilar from the primary component of both liquid phases.

- 197, for subject matter related to breaking (resolving) or inhibiting of emulsions using centrifuging, mechanical shocking, or specified agitating, and without using an added material\* dissimilar from the primary component of both liquid phases.

**SEE OR SEARCH CLASS:**

- 210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses in the 520 series of classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.
- 524, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, cross-reference art collection 922 for flocculating, clarifying, or fining compositions.
- 528, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, cross-reference art collections 934+ for subject matter relating to recovery and physical processing of natural rubber latex (particularly cross-reference art collection 936 for coagulating).

**140. The agent is liquid bath or liquid which acts to physically or chemically dissolve, bind, or destroy at least part of one liquid phase (except a colloid system making or stabiliz-**

**ing agent) (e.g., aqueous CaCl<sub>2</sub> for chemically binding water):**

This subclass is indented under subclass 139. Subject matter in which the breaking (resolving) or inhibiting agent\* contains liquid bath or liquid which acts to physically or chemically dissolve, bind, or destroy at least part of one liquid phase (except a colloid system making or stabilizing agent\*), such as, aqueous CaCl<sub>2</sub> for chemically binding water.

- (1) Note. Agents\* which bind includes material\* that chemically hydrates (i.e., they bind water).
- (2) Note. Subject matter of the class which encompasses agents\* which act solely on a colloid system making or stabilizing agent\* is excluded from this subclass.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 135, for dilution performed only with a material\* which is the same as the primary component of one of the two liquid phase in order to effect breaking (resolving) or inhibiting of a colloid system, and not combined with a step of vaporizing, heating, or cooling (as provided for subclasses 194+, below) and not combined with a step of centrifuging, mechanical shocking, or specified agitating (as provided for in subclass 197, below), there being no indented subclass providing for this subject matter.
- 136+, for subject matter in which the breaking (resolving) or inhibiting agent\* contains a solid surface functioning material\*, i.e., solid adsorbent, absorbent, or differential adherence surface, such as, filter media, sharp edged particles.
- 196, for subject matter related to breaking (resolving) or inhibiting of emulsions using vaporizing, heating, or cooling and further combined with diluting with a principal component of one of the phases, and without using an added material\* dissimilar from the primary component of both liquid phases.
- 197, for subject matter related to breaking (resolving) or inhibiting of emulsions

using centrifuging, mechanical shocking, or specified agitating, and without using an added material\* dissimilar from the primary component of both liquid phases.

**SEE OR SEARCH CLASS:**

- 210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).

**141. Aqueous-petroleum, petroleum-**aqueous**, aqueous-hydrocarbon, or hydrocarbon-**aqueous** emulsion systems:**

This subclass is indented under subclass 139. Subject matter in which the emulsion system is aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous.

- (1) Note. Subject matter relating to breaking (resolving) or inhibiting of an emulsion which does not exist as an emulsion at standard temperature and pressure, for example an emulsion of melted wax in an aqueous continuous phase at an elevated temperature, is proper for this and indented subclasses.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 113, for breaking (resolving) or inhibiting of solid or semi-solid bituminous material\* in suspensions, or of gels, such as asphalt or paraffin wax.

**SEE OR SEARCH CLASS:**

- 166, Wells, subclasses 244.1+ for processes of preventing emulsification or of breaking emulsions in a well, which includes significantly claimed process steps of well treating or well operation. See also the Notes and SEARCH CLASS references in Class 166 subclass 244.1.
- 204, Chemistry: Electrical and Wave Energy, subclasses 193+ for apparatus for electrical separation or purifica-

- tion of liquids, subclasses 450+ for processes of separating or purifying using electrophoresis or electro-osmosis (especially subclass 514 for separation of hydrocarbon oil in an aqueous system (e.g., emulsion breaking)), subclasses 554+ for processes (e.g., electrostatic separation of a liquid) involving (a) electrical (including simultaneous electrical and magnetic) separation or purification of a liquid, or (b) magnetic treatment, per se, when some effect other than mere separation is desired or produced (especially subclasses 563+ for process which involves breaking emulsion or dispersion by agglomerating or accreting suspended constituents in a predominantly hydrocarbon liquid, subclass 573 for process which involves breaking emulsion or dispersion by agglomerating or accreting suspended constituents in other than a predominantly hydrocarbon liquid).
- 208, Mineral Oils: Processes and Products, subclasses 39+ for processes of removing water from asphalts, tars, pitches, or resins, subclasses 177+ for mere removal of a colloid system stabilizing agent from a mineral oil for the purpose of preventing formation of an emulsion or colloid system containing the mineral oil (particularly subclasses 179+ for processes of removing water from used mineral oils, subclasses 187+ for the separation of water emulsified with the oil, subclass 263 for removing undesirable organic acids or phenolic components from mineral oils. Class 516 provides for breaking of emulsions of mineral oil when not combined with some other treatment of the mineral oil, i.e., Class 516 provides for effecting breaking or inhibiting by merely adding an agent\* for that purpose and permitting or causing separation (e.g., by settling).
- 210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).
- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes of resolving colloid systems which include fermentation (especially 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil which may involve breaking emulsions), subclasses 283.1+ for Class apparatus.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, cross-reference art collection 921 for well treating composition intended to break an emulsion or gel or to uncrosslink a polymer.
- 142. The agent contains both organic and inorganic (except water) material:**  
This subclass is indented under subclass 141. Subject matter in which the breaking (resolving) or inhibiting agent\* contains both organic\* material\* and inorganic\* (except water) materials\*.
- (1) Note. "Inorganic\* (except water)" means water is not considered in the assessment of the composition of the inorganic\* material\*.
- SEE OR SEARCH THIS CLASS, SUBCLASS:**
- 116+, for similar subject matter related to breaking (resolving) or inhibiting of foams.
- 137, for similar subject matter in which the emulsion breaking (resolving) or inhibiting agent\* contains a solid material\*, e.g., solid adsorbent, absorbent, differential adherence surface, filter media, sharp edged particles.
- SEE OR SEARCH CLASS:**
- 166, Wells, subclasses 244.1+ for processes of preventing emulsification or of breaking emulsions in a well, which includes significantly claimed process steps of well treating or well operation. See also the Notes and

- SEARCH CLASS references in Class 166 subclass 244.1.
- 210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).
- 143. The agent contains organic compound:**  
This subclass is indented under subclass 141. Subject matter in which the breaking (resolving) or inhibiting agent\* contains an organic\* compound.
- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 115, for similar subject matter related to breaking (resolving) or inhibiting of foams.
- 136, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using solid material\* which is entirely organic\* material\* or the nature of it is indeterminable, e.g., solid adsorbent, absorbent, differential adherence surface, filter media, sharp edged particles.
- 161+, for subject matter wherein the agent comprises materials which are impurely or crudely derived from plant or animal sources that are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.
- SEE OR SEARCH CLASS:
- 166, Wells, subclasses 244.1+ for processes of preventing emulsification or of breaking emulsions in a well, which includes significantly claimed process steps of well treating or well operation. See also the Notes and SEARCH CLASS references in Class 166, subclass 244.1.
- 210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).
- 144. The compound contains silicon:**  
This subclass is indented under subclass 143. Subject matter in which the organic\* compound contains silicon.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 123+, for similar subject matter related to breaking (resolving) or inhibiting of foams.
- SEE OR SEARCH CLASS:
- 210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).
- 145. The compound contains phosphorus (e.g., sulfonated lecithin):**  
This subclass is indented under subclass 143. Subject matter in which the organic\* compound contains phosphorus.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 125, for similar subject matter related to breaking (resolving) or inhibiting of foams.
- SEE OR SEARCH CLASS:
- 210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-

reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).

**146. The compound contains sulfoxy\* (e.g., sulfonate terpene):**

This subclass is indented under subclass 143. Subject matter in which the organic\* compound contains sulfoxy\*, such as, sulfonate terpene.

SEE OR SEARCH THIS CLASS, SUBCLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).

**147. The compound contains polymer of substituted or unsubstituted phenol and substituted or unsubstituted aldehyde:**

This subclass is indented under subclass 146. Subject matter in which the organic\* compound which contains sulfoxy\* also contains the polymeric or resinous reaction product of substituted or unsubstituted phenol with substituted or unsubstituted aldehyde.

SEE OR SEARCH THIS CLASS, SUBCLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. As set forth in the section LINES WITH OTHER CLASSES AND WITHIN THIS

CLASS in Class 252 definition, the subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.

521, Synthetic Resins or Natural Rubbers, subclass 28 for a mixture of a synthetic ion exchange resin which may be in gel form, subclasses 50+ for cellular products or processes of preparing a cellular product, e.g., foams, pores, channels, and subclasses 53+ for the gel of a porous synthetic resin.

523, Synthetic Resins or Natural Rubbers, subclasses 100 through 181 for non-porous synthetic polymeric materials with specified functions or uses and for intentional composition, or process of preparing same, of specifically provided for special use, application, or property (e.g., subclass 171 for composition having opalescent, pearlescent, or variegated color or subclass 175 for liquid-solid drag reduction composition).

524, Synthetic Resins or Natural Rubbers, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof, subclass 801 for process of preparing water-in-oil emulsion or dispersion, or product thereof, cross-reference art collection 903 for art collection disclosing aerosol compositions, cross-reference art collection 916 for art collection disclosing hydrogel compositions, and cross-reference art collection 922 for art collection disclosing flocculating, clarifying, or fining compositions.

528, Synthetic Resins or Natural Rubbers, cross-reference art collections 934+ for subject matter relating to recovery and physical processing of natural

rubber latex (particularly cross-reference art collection 936 for coagulating).

**148. The compound contains nitrogen, except if present solely as NH 4+:**

This subclass is indented under subclass 146. Subject matter in which the organic\* compound containing sulfoxy\* also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**149. Nitrogen is a ring member (e.g., imidazoline salt of an organosulfonic acid):**

This subclass is indented under subclass 148. Subject matter in which the nitrogen of the organic\* sulfoxy\* containing compound is a member of a ring structure, such as, imidazoline salt of an organosulfonic acid.

- (1) Note: In order to be considered a ring, nonionic bonding must exist between all ring members. Inner salt compounds such as betaines, sulfobetaines, etc., wherein two ring members are attached to each other by ionic bonding, are not regarded as rings for purposes of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**150. The compound contains -C(=O)NHH or -S(O 2)NHH where substitution may be made for the hydrogen:**

This subclass is indented under subclass 148. Subject matter in which the organic\* compound contains -C(=O)NHH group or -S(O 2)NHH group where substitution may be made for the hydrogen.

- (1) Note. This subclass includes amido and sulfonamido group containing compounds, such as, imido, sulfonimido,

urea, sulfonated succinimide, condensation of ammonium, amine, or quaternary amine with an organic\* acid, its ester or anhydride, or acyl halide.

SEE OR SEARCH THIS CLASS, SUBCLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**151. The nitrogen is part of the cation of a salt formed with the organic compound containing sulfoxy\* (e.g., triethanol amine salt, quaternary amine salt):**

This subclass is indented under subclass 148. Subject matter in which the nitrogen of the organic\* sulfoxy\* containing compound is a part of the cation of a salt formed with the organic\* compound containing sulfoxy\*, such as, triethanol amine salt, quaternary amine salt.

- (1) Note. The anion of the salt does not have to be the sulfoxy\* group of the organosulfoxy\* compound.

SEE OR SEARCH THIS CLASS, SUBCLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**152. The agent contains mineral-oil\* sulfonic acid (e.g., cyclohexylamine salt of mahogany\* or green\* acid):**

This subclass is indented under subclass 151. Subject matter in which the salt contains mineral-oil\* sulfonic acid, such as, cyclohexylamine salt of mahogany\* or green\* acids.

- (1) Note. Mineral-oil\* sulfonic acid results from mineral-oil\* (see glossary definition) which has been sulfonated, e.g., by sulfuric acid. Mahogany\* acid is the oil-soluble fraction of sulfonation of petroleum\* oil; green\* acid is the oil-insoluble fraction of sulfonation of petroleum\* oil.
- (2) Note. A substantially pure hydrocarbon is not a mineral-oil\*, hence the sulfonation product of such does not constitute an agent\* for breaking (resolving) or inhibiting for this subclass.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**153. The anion of the salt contains substituted or unsubstituted benzene ring (e.g., cyclohexylamine salt of alkylated naphthalene sulfonic acid):**

This subclass is indented under subclass 151. Subject matter in which the anion of the salt contains substituted or unsubstituted benzene ring, such as, cyclohexylamine salt of alkylated naphthalene sulfonic acid.

- (1) Note. The agent\* may be a mixture of sulfonated benzene ring containing compounds. However, if the feedstock for sulfonation was a mineral-oil\* (see glossary definition) then the subject matter is located elsewhere.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

152, for subject matter wherein the agent was derived from sulfonation of mineral-oil\* feedstock.

**154. The compound contains carboxylic acid ester group:**

This subclass is indented under subclass 146. Subject matter in which the sulfoxy\* containing organic\* compound also contains carboxylic acid ester group.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**155. The compound contains -C(=O)OH or salt thereof (e.g., partial ester, mixed ester, product of Twitchell process):**

This subclass is indented under subclass 154. Subject matter in which the sulfoxy\* containing organic\* compound which contains a carboxylic acid ester group also contains -

C(=O)OH or salt thereof, such as, partial ester, mixed ester, products of Twitchell process.

- (1) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters (-C(=O)OR where R is an organic\* group).

- (2) Note. Sulfonated glycerides are proper for this subclass since natural glycerides are mixed esters (contain acid group and ester group) and the sulfonation conditions typically do not alter these moieties.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**156. The compound contains ether group:**

This subclass is indented under subclass 154. Subject matter in which the sulfoxy\* containing organic\* compound which contains a carboxylic acid ester group also contains an ether group.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**157. The compound contains -C(=O)OH or salt thereof (e.g., sulfonated oleic acid):**

This subclass is indented under subclass 146. Subject matter in which the sulfoxy\* containing organic\* compound also contains -C(=O)OH group or salt thereof, such as, sulfonated oleic acid.

- (1) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters (-C(=O)OR where R is an organic\* group).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.



**158. The compound contains ether (e.g., cellulose sulfate):**

This subclass is indented under subclass 146. Subject matter in which the sulfoxy\* containing organic\* compound also contains an ether group, such as, cellulose sulfate.

SEE OR SEARCH THIS CLASS, SUBCLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**159. The compound is mineral-oil\* sulfonic acid (e.g., mahogany\* or green\* acid):**

This subclass is indented under subclass 146. Subject matter in which the sulfoxy\* containing organic\* compound is mineral-oil\* sulfonic acid, such as, mahogany\* or green\* acid(s).

(1) Note. Mineral-oil\* sulfonic acid results from mineral-oil\* (see glossary definition) which has been sulfonated, e.g., by sulfuric acid. Mahogany\* acid is the oil-soluble fraction of sulfonation of petroleum\* oil; green\* acid is the oil-insoluble fraction of sulfonation of petroleum\* oil.

(2) Note. A substantially pure hydrocarbon is not a mineral-oil\*, hence the sulfonation product of such does not constitute an agent\* for breaking (resolving) or inhibiting for this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

160, for similar subject matter related to breaking (resolving) or inhibiting of such colloid systems using an agent\* containing a compound containing a sulfonated substituted or unsubstituted benzene ring.

**160. The compound contains substituted or unsubstituted benzene ring (e.g., sulfonated**

**nonylphenol, ammonium salt of butylated naphthalene sulfonic acid):**

This subclass is indented under subclass 146. Subject matter in which the sulfoxy\* containing organic\* compound also contains substituted or unsubstituted benzene ring, such as, sulfonated nonyl phenol, ammonium salt of butylated naphthalene sulfonic acid.

(1) Note. The agent\* may be a mixture of sulfonated benzene ring containing compounds. However, if the feedstock for sulfonation was a mineral-oil\* (see glossary definition) then the subject matter is located elsewhere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

126+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

159, for subject matter wherein the agent\* was derived from sulfonation of mineral-oil\* feedstock.

**161. The compound contains nitrogen, except if present solely as NH 4+ (e.g., nitroso phenol):**

This subclass is indented under subclass 143. Subject matter in which the organic\* compound contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+, such as, nitroso phenol.

(1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain Nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-

reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).

**162. The nitrogen is a ring member:**

This subclass is indented under subclass 161. Subject matter in which the nitrogen in the organic\* compound is a member of a ring structure.

- (1) Note: In order to be considered a ring, nonionic bonding must exist between all ring members. Inner salt compounds such as betaines, sulfobetaines, etc., wherein two ring members are attached to each other by ionic bonding, are not regarded as rings for purposes of this subclass and its indent subclass.
- (2) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

SEE OR SEARCH CLASS:

435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microor-

ganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), foreign art collection FOR184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.

**163. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 162. Subject matter in which the organic\* compound which also contains nitrogen as a member of a ring structure also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**164. The compound contains polymer of substituted or unsubstituted phenol and substituted or unsubstituted aldehyde:**

This subclass is indented under subclass 161. Subject matter in which the organic\* compound which contains nitrogen also contains the polymeric or resinous reaction product of substituted or unsubstituted phenol with substituted or unsubstituted aldehyde.

SEE OR SEARCH THIS CLASS, SUBCLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. As set forth in the sec-

- tion LINES WITH OTHER CLASSES AND WITHIN THIS CLASS in Class 252 definition, the subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.
- 521, Synthetic Resins or Natural Rubbers, subclass 28 for a mixture of a synthetic ion exchange resin which may be in gel form, subclasses 50+ for cellular products or processes of preparing a cellular product, e.g., foams, pores, channels, and subclasses 53+ for the gel of a porous synthetic resin.
- 523, Synthetic Resins or Natural Rubbers, subclasses 100 through 181 for non-porous synthetic polymeric materials with specified functions or uses and for intentional composition, or process of preparing same, of specifically provided for special use, application, or property (e.g., subclass 171 for composition having opalescent, pearlescent, or variegated color or subclass 175 for liquid-solid drag reduction composition).
- 524, Synthetic Resins or Natural Rubbers, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof, subclass 801 for process of preparing water-in-oil emulsion or dispersion, or product thereof, cross-reference art collection 903 for art collection disclosing aerosol compositions, cross-reference art collection 916 for art collection disclosing hydrogel compositions, and cross-reference art collection 922 for art collection disclosing flocculating, clarifying, or fining compositions.
- 528, Synthetic Resins or Natural Rubbers-- Part of the Class 520 Series, cross-reference art collections 934+ for subject matter relating to recovery and physical processing of natural rubber latex (particularly cross-reference art collection 936 for coagulating).
- 165. The compound contains -C(=O)NHH where substitution may be made for the hydrogen:**  
This subclass is indented under subclass 164. Subject matter in which the organic\* compound which contains nitrogen and is the polymeric or resinous reaction product of substituted or unsubstituted phenol with substituted or unsubstituted aldehyde also contains -C(=O)NHH group where substitution may be made for the hydrogen.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.  
164, See (1) Note concerning polymer art.
- 166. The nitrogen is present in the cation of a salt:**  
This subclass is indented under subclass 164. Subject matter in which the nitrogen of the organic\* compound which contains nitrogen and is the polymeric or resinous reaction product of substituted or unsubstituted phenol with substituted or unsubstituted aldehyde is present in the cation of a salt.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.  
164, see the SEARCH CLASS notes concerning polymer art.
- 167. The compound contains carboxylic acid ester group:**  
This subclass is indented under subclass 164. Subject matter in which the organic\* compound which contains nitrogen and is the polymeric or resinous reaction product of substituted or unsubstituted phenol with substituted or unsubstituted aldehyde also contains carboxylic acid ester group.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

164, see the SEARCH CLASS notes concerning polymer art.

**168. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene) (e.g., alkoxylated phenol-aldehyde polymer):**

This subclass is indented under subclass 164. Subject matter in which the organic\* compound which contains nitrogen and is the polymeric or resinous reaction product of substituted or unsubstituted phenol with substituted or unsubstituted aldehyde also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene), such as, alkoxylated phenol-aldehyde polymer.

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

164, see the SEARCH CLASS notes concerning polymer art.

**169. The compound contains -C(=O)NHH group where substitution may be made for the hydrogen:**

This subclass is indented under subclass 161. Subject matter in which the organic\* compound which contains nitrogen contains -C(=O)NHH group where substitution may be made for the hydrogen.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**170. The compound contains plural peptide linkages, i.e., compound formed from amino**

**acids, natural or synthetic, by reaction of a carboxyl group of one such amino acid with an amino group of another same or different such amino acid:**

This subclass is indented under subclass 169. Subject matter in which the organic\* compound which contains C(=O)NHH group where substitution may be made for the hydrogen contains plural peptide linkages, i.e., compound formed from natural or synthetic amino acids.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**171. The compound contains plural -C(=O)NHH where substitution may be made for the hydrogen (e.g., urea formaldehyde):**

This subclass is indented under subclass 169. Subject matter in which the organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen contains 2 or more such C(=O)NHH groups where substitution may be made for the hydrogen.

- (1) Note. The plural -C(=O)NHH groups do not have to be bonded directly to each other.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**172. The compound contains plural nitrogen containing mers\* bonded directly to each other (e.g., acylated polyamine, polyamide):**

This subclass is indented under subclass 171. Subject matter in which the organic\* compound which contains 2 or more -C(=O)NHH group where substitution may be made for the hydrogen contains 2 or more nitrogen containing mers\* bonded directly to each other, such as, acylated polyamine, polyamide.

- (1) Note. The nitrogen containing mer\* does not have to be amido group containing, thus acylated polyamines are provided for here.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**173. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 169. Subject matter in which the organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**174. The compound is a salt composed of an organic anion and a nitrogen-containing organic cation (e.g., triethanol amine salt of oleic acid):**

This subclass is indented under subclass 161. Subject matter in which the organic\* compound which contains nitrogen is a salt composed of an organic\* anion and a nitrogen-containing organic\* cation, such as, triethanol amine salt of oleic acid.

- (1) Note. This definition excludes carbonic acid salts and ammonium salts.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**175. The salt contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 174. Subject matter in which the salt also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**176. The compound contains carboxylic acid ester group:**

This subclass is indented under subclass 161. Subject matter in which the organic\* compound which contains nitrogen also contains carboxylic acid ester group.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**177. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 176. Subject matter in which the organic\* compound which contains nitrogen and carboxylic acid ester group also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**178. The ester group is derived from mono-basic acid reactant:**

This subclass is indented under subclass 177. Subject matter in which the organic\* compound which contains nitrogen and carboxylic acid ester group and repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene) is further characterized by the carboxylic acid ester being derived from mono-basic acid reactant.

SEE OR SEARCH THIS CLASS, SUBCLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**179. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

This subclass is indented under subclass 161. Subject matter in which the organic\* compound which contains nitrogen also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

(1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**180. The compound contains plural nitrogen containing mers\* bonded directly to each other (e.g., poly-diallyldimethylammonium chloride, polyamine):**

This subclass is indented under subclass 161. Subject matter in which the organic\* compound which contains nitrogen contains 2 or more nitrogen containing mers\* bonded directly to each other, such as, poly-diallyldimethylammonium chloride, polyamine.

SEE OR SEARCH THIS CLASS, SUBCLASS:

128+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**181. The compound contains oxygen (e.g., cresylic acid):**

This subclass is indented under subclass 143. Subject matter in which the organic\* compound contains oxygen, such as, cresylic acid.

(1) Note. Phenol-aldehyde resins, polymers, reaction products and the like (e.g., phenol-formaldehyde resinous materials\*) are assumed to include a minor presence of ether linkages as well as the alkylene and are so classified, unless the reference explicitly teaches otherwise.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclass 708 for processes in which an emulsion is treated by a chemical or physical agent to cause the discontinuous phase to coalesce, and cross-reference art collections 922+ for oil spill cleanup (e.g., cross-reference art collection 925 for using chemical agent).

**182. The compound contains sulfur (except sulfoxy\*) (e.g., sulfide or disulfide linkage):**

This subclass is indented under subclass 181. Subject matter in which the organic\* compound which contains oxygen also contains sulfur (except sulfoxy\*), such as, sulfide or disulfide linkage.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

146+, for subject matter wherein the agent\* contains a sulfoxy\* group.

**183. The compound contains polymer of substituted or unsubstituted phenol and substituted or unsubstituted aldehyde:**

This subclass is indented under subclass 181. Subject matter in which the organic\* compound which contains oxygen contains the polymeric or resinous reaction product of substituted or unsubstituted phenol with substituted or unsubstituted aldehyde.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. As set forth in the section **LINES WITH OTHER CLASSES AND WITHIN THIS CLASS** in Class 252 definition, the subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.

521, Synthetic Resins or Natural Rubbers, subclass 28 for a mixture of a synthetic ion exchange resin which may be in gel form, subclasses 50+ for cellular products or processes of preparing a cellular product, e.g., foams, pores, channels, and subclasses 53+ for the gel of a porous synthetic resin.

523, Synthetic Resins or Natural Rubbers, subclasses 100 through 181 for nonporous synthetic polymeric materials with specified functions or uses and for intentional composition, or process of preparing same, of specifically provided for special use, application, or property (e.g., subclass 171 for composition having opalescent, pearl-

escent, or variegated color or subclass 175 for liquid-solid drag reduction composition).

524, Synthetic Resins or Natural Rubbers, subclasses 457+ for polymerizing an ethylenic monomer in the presence of a preformed SICP or solid polymer and in the presence of a nonreactive material so as to form an aqueous dispersion, latex, suspension, or emulsion therewith, or product thereof, subclass 801 for process of preparing water-in-oil emulsion or dispersion, or product thereof, cross-reference art collection 903 for art collection disclosing aerosol compositions, cross-reference art collection 916 for art collection disclosing hydrogel compositions, and cross-reference art collection 922 for art collection disclosing flocculating, clarifying, or fining compositions.

528, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, cross-reference art collections 934+ for subject matter relating to recovery and physical processing of natural rubber latex (particularly cross-reference art collection 936 for coagulating).

**184. The compound contains carboxylic acid ester group:**

This subclass is indented under subclass 183. Subject matter in which the organic\* compound which contains the polymeric or resinous reaction product of substituted or unsubstituted phenol with substituted or unsubstituted aldehyde also contains carboxylic acid ester group.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

183, See (1) Note concerning polymer art.

**185. The compound contains carboxylic acid ester group (e.g., lactone, natural (glyceride) oil, oxyalkylated blown fatty acid \*):**

This subclass is indented under subclass 181. Subject matter in which the organic\* compound which contains oxygen contains carboxylic acid ester group, such as, lactone, natural

(glyceride) oil, oxyalkylated blown fatty acid \*.

- (1) Note. A step of oxyalkylating in the presence of carboxylic acid is assumed to fully esterify any carboxy groups present and hence is provided for in this subclass rather than indented below, unless the reference explicitly teaches otherwise, such as by specifying a stoichiometrically insufficient amount of reactants to fully esterify.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**186. The compound contains -C(=O)OH or salt thereof (e.g., partial ester, fractional ester, blown fatty acid \*):**

This subclass is indented under subclass 185. Subject matter in which the organic\* compound which contains carboxylic acid ester group also contains -C(=O)OH group or salt thereof, such as, partial ester, fractional ester, blown fatty acid \*.

- (1) Note. -C(=O)OH group or salt thereof does NOT include carboxylic acid esters (-C(=O)OR where R is an organic\* group).
- (2) Note. Blown fatty acid \* is oxidized fatty acids which have increased saponification value and acid value, and therefore are assumed to contain both acid and ester groups, which combination of groups is provided for in this subclass and its indents.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**187. The compound contains ether group:**

This subclass is indented under subclass 186. Subject matter in which the organic\* compound which contains carboxylic acid ester group and contains -C(=O)OH group or salt thereof also contains ether group.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**188. The compound is a carbohydrate\* or carbohydrate-derivative\*:**

This subclass is indented under subclass 187. Subject matter in which the organic\* compound which contains oxygen is a carbohydrate\* or carbohydrate-derivative\*, such as, monosaccharide or polysaccharide.

- (1) Note. Carbohydrates are compounds which are saccharides whose monomeric units are polyhydroxy mono-aldehydes or polyhydroxy mono-ketones, having the formula  $C_n(H_2O)_n$ , where n is five or six, or the corresponding cyclic hemiacetals thereof. Carbohydrate-derivatives maintain the carbon skeleton and the carbonyl function or hemi-acetal function of the saccharide.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**189. The compound contains ether group:**

This subclass is indented under subclass 185. Subject matter in which the organic\* compound which contains carboxylic acid ester group also contains ether group.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**190. The compound contains -C(=O)OH or salt thereof (e.g., glyceride soap, naphthenic acid):**

This subclass is indented under subclass 181. Subject matter in which the organic\* compound which contains oxygen contains -C(=O)OH group or salt thereof, such as, glyceride soap, naphthenic acid.



- (1) Note.  $-C(=O)OH$  group or salt thereof does NOT include carboxylic acid esters ( $-C(=O)OR$  where R is an organic\* group).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**191. The compound contains ether group (e.g., polyethylene oxide):**

This subclass is indented under subclass 181. Subject matter in which the organic\* compound which contains oxygen contains ether group, such as, polyethylene oxide.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**192. The compound is a carbohydrate\* or carbohydrate-derivative\*:**

This subclass is indented under subclass 191. Subject matter in which the organic\* compound which contains oxygen is a carbohydrate\* or carbohydrate-derivative\*, such as, monosaccharide or polysaccharide.

- (1) Note. Carbohydrates are compounds which are saccharides whose monomeric units are polyhydroxy mono-aldehydes or polyhydroxy mono-ketones, having the formula  $C_n(H_2O)_n$ , where n is five or six, or the corresponding cyclic hemiacetals thereof. Carbohydrate-derivatives maintain the carbon skeleton and the carbonyl function or hemi-acetal function of the saccharide.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**193. The compound contains substituted or unsubstituted benzene ring (e.g., oxyalkylated bisphenol):**

This subclass is indented under subclass 191. Subject matter in which the organic\* compound which contains ether group also contains substituted or unsubstituted benzene ring (e.g., oxyalkylated bisphenol).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

132+, for similar subject matter related to breaking (resolving) or inhibiting of foams.

**194. Breaking (resolving) or inhibiting by vaporizing, heating, or cooling:**

This subclass is indented under subclass 135. Subject matter in which breaking (resolving) or inhibiting the emulsion colloid system is performed by vaporizing, heating, or cooling.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

135, for dilution performed only with a material\* which is the same as the primary component of one of the two liquid phase in order to effect breaking (resolving) or inhibiting of a colloid system, and not combined with a step of vaporizing, heating, or cooling (as provided for subclasses 194+, below) and not combined with a step of centrifuging, mechanical shocking, or specified agitating (as provided for in subclass 197, below), there being no indented subclass providing for this subject matter.

136+, for subject matter in which the breaking (resolving) or inhibiting agent\* contains a solid surface functioning material\*, i.e., solid adsorbent, absorbent, or differential adherence surface, such as, filter media, sharp edged particles.

139+, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains material\* different from the primary components of both liquid phases of the colloid system, other than as provided for in subclasses 136+ (using an agent\* which is solid

surface functioning), and other than as provided for in subclass 140 (physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*)); particularly subclass 141 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which is only inorganic\*, and subclass 142 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which contains both organic\* material\* and inorganic\* material\*.

- 197, for subject matter related to breaking (resolving) or inhibiting of emulsions using centrifuging, mechanical shocking, or specified agitating, and without using an added material\* dissimilar from the primary component of both liquid phases.

**195. With centrifuging, mechanical shocking, or specified agitating:**

This subclass is indented under subclass 194. Subject matter in which breaking (resolving) or inhibiting the emulsion colloid system is performed by vaporizing, heating, or cooling and is further combined with (or simultaneous with) a step of centrifuging, mechanical shocking, or specified agitating.

- (1) Note. Specified agitating means the operation or step of agitating includes more than merely the use of the term agitating or synonym thereof, such as, a stated RPM, high-shear, specified impeller type, length of time. If the specific feature is not claimed, placement is not mandatory.

**196. With dilution by principal component of one of the phases:**

This subclass is indented under subclass 194. Subject matter in which breaking (resolving) or inhibiting the emulsion colloid system is performed by vaporizing, heating, or cooling and

is further combined with (or simultaneous with) a step of dilution by a principal component of one of the phases.

**197. Breaking (resolving) or inhibiting by centrifuging, mechanical shocking, or specified agitating:**

This subclass is indented under subclass 135. Subject matter in which breaking (resolving) or inhibiting the emulsion colloid system is performed by centrifuging, mechanical shocking, or specified agitating.

- (1) Note. Specified agitating means the operation or step of agitating includes more than merely the use of the term agitating or synonym thereof, such as, a stated RPM, high-shear, specified impeller type, length of time. If the specific feature is not claimed, placement is not mandatory.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 135, for dilution performed only with a material\* which is the same as the primary component of one of the two liquid phase in order to effect breaking (resolving) or inhibiting of a colloid system, and not combined with a step of vaporizing, heating, or cooling (as provided for subclasses 194+, below) and not combined with a step of centrifuging, mechanical shocking, or specified agitating (as provided for in subclass 197, below), there being no indented subclass providing for this subject matter.
- 136+, for subject matter in which the breaking (resolving) or inhibiting agent\* contains a solid surface functioning material\*, i.e., solid adsorbent, absorbent, or differential adherence surface, such as, filter media, sharp edged particles.
- 139+, for similar subject matter related to breaking (resolving) or inhibiting of emulsions using an agent\* which contains material\* different from the primary components of both liquid phases of the colloid system, other than as provided for in subclasses 136+ (using an agent\* which is solid surface functioning), and other than as

provided for in subclass 140 (physically or chemically dissolving binding, or destroying or at least part of one liquid phase (other than the colloid system making or stabilizing agent\*)); particularly subclass 141 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which is only inorganic\*, and subclass 142 for breaking (resolving) or inhibiting of aqueous-petroleum\*, petroleum\*-aqueous, aqueous-hydrocarbon, or hydrocarbon-aqueous emulsions using an agent\* which contains a material\* which contains both organic\* material\* and inorganic\* material\*.

194+, for subject matter related to breaking (resolving) or inhibiting of emulsions using vaporizing, heating, or cooling, and without using an added material\* dissimilar from the primary component of both liquid phases.

**198. COMPOSITIONS CONTAINING A WETTING AGENT; PROCESSES OF WETTING; PROCESSES OF PREPARING THE COMPOSITIONS (E.G., SPREADING, PENETRATING, LEVELING):**

This subclass is indented under the class definition. Subject matter which is a (1) composition specialized and designed for or peculiar to use in wetting surfaces, (2) mere methods of using such compositions or of using compounds, per se, to perform a process of wetting (3) compositions useful in making compositions for wetting, or (4) methods of making the compositions; which includes uses described by such terms as spreading, penetrating, or leveling.

(1) Note. Agent\* refers to the effective material\*, energy, or means which acts in the given context. The term agent also includes subcombinations of an agent\* composition, such as adjuvants\*. (Thus, the term agent\* may apply to a compound or composition which may not be fully functional for its stated context, or its functionality may be greatly enhanced by another component which

is not present.) Note that although a compound can be an agent\*, this class does not provide for compounds, per se. An agent\* may be physical or energy.

**SEE OR SEARCH CLASS:**

- 8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers. See the main class definition for the special use compositions classified therein, which include those compositions (or appropriate methods) which are claimed as specifically intended for such use, including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods (such as surfactant compositions, per se). Surfactants and colloid systems useful in Class 8 processes and compositions include, but are not limited to, wetting agents (e.g., with dyes), deaerating agents, foam suppressants, foam carriers (e.g., for dyeing, finishing, coating), see subclasses 400 through 696 for dyeing compositions including wetting agents.
- 137, Fluid Handling, subclass 13 for processes in which flow of fluent material is facilitated by the addition of material which affects the flow characteristics of the fluent material (e.g., suspending agent, viscosity reducing agent), or by the application of heat or other forms of energy.
- 162, Paper Making and Fiber Liberation, digest 3 for wetting agent.
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclass 699 for electrolytic erosion of a workpiece for shape or surface change (e.g., etching, polishing, etc.) (process and electrolyte composition) wherein the electrolyte is held into contact with a portion of the workpiece surface by surface tension or capillary action.
- 424, Drug, Bio-Affecting and Body Treating Compositions, subclass 70.19 for compositions which have topical non-therapeutic utility for treating the hair or scalp of the living body (e.g. grooming or adorning aids, tonics,

- rinses) which contain two or more surfactants (i.e. compounds that lower the surface or interfacial tension, including detergents, foaming or wetting agents, emulsifiers, solubilizers, or dispersants) which are either designated in the claims or are art recognized as such.
- 429, Chemistry: Electrical Current Producing Apparatus, Product and Process, subclass 250 for apparatus having separator, retainer, spacer or materials for use for producing an electrical current in combination with a wetting agent or surfactant.
- 504, Plant Protecting and Regulating Compositions, appropriate subclasses for a plant stimulating or eradicating composition; including colloid systems, wetting agents, subcombination compositions therefor, or appropriate methods which are claimed as specifically intended for such use.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, antiflocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents, subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be wetting agents. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to wetting agents include: subclass 364 for compositions for displacing organic liquid film from a solid surface which may include a wetting agent, subclass 365 for compositions for removing greasy or oily contaminant from a substrate which may include a wetting agent, subclasses subclass 514 for dishwasher rinse composition which may be a wetting agent.
- 514, Drug, Bio-Affecting and Body Treating Compositions, cross-reference art collection 946+ for subject matter involving the increasing or enhancing of the rate or amount of active ingredient absorbed into the treated subject (e.g., skin, digestive tract).
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses for (1) synthetic resins, per se, or (2) resin containing compositions, the use or utility of which is not specifically provided for elsewhere. The subject matter of the Class 520 series is hierarchically superior to Class 516 for placement of ORs (original reference). subclass 1 of Class 520 is the residual subclass for solid resin containing subject matter. See various subclasses in the 520 series of classes for aqueous or organic dispersions, latexes, or gels, of a polymer or natural or synthetic rubber, and methods of making or treating same.
- 523, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclass 175 for liquid-solid drag reduction composition).
- 199. The agent contains organic compound containing phosphorus:**  
This subclass is indented under subclass 198. Subject matter in which the wetting agent\* contains an organic\* compound containing Phosphorus.

**200. The agent contains organic compound containing sulfoxy\*:**

This subclass is indented under subclass 198. Subject matter in which the wetting agent\* contains an organic\* compound containing sulfoxy\*.

- (1) Note. The term sulfoxy\* means a radical containing a sulfur-oxygen double bond. Examples of sulfoxy\* containing compounds include; sulfate, sulfonate, and sulfone compounds.

**201. The compound contains nitrogen, except if present solely as NH 4+:**

This subclass is indented under subclass 200. Subject matter in which the wetting agent\* which contains an organic\* compound containing sulfoxy\* also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.

**202. The compound contains -C(=O)OH group or salt thereof:**

This subclass is indented under subclass 200. Subject matter in which the wetting agent\* which contains an organic\* compound containing sulfoxy\* also contains -C(=O)OH group or salt thereof.

- (1) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters (-C(=O)OR where R is an organic\* group).

**203. The agent contains organic compound containing nitrogen, except if present solely as NH 4+:**

This subclass is indented under subclass 198. Subject matter in which the wetting agent\* contains an organic\* compound containing nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.

- (1) Note. Materials\* used as agents\* which are impurely or crudely derived from plant or animal sources, are assumed to contain nitrogen-containing organic\* compounds (i.e., the DNA and proteins), unless clearly separated out, such as cellulose, carbohydrate fractions, etc.

**204. The agent contains organic compound containing oxygen (e.g., carboxylic acid ester):**

This subclass is indented under subclass 198. Subject matter in which the wetting agent\* contains an organic\* compound containing oxygen, such as, carboxylic acid ester.

**CROSS-REFERENCE ART COLLECTIONS****900. LIQUID CRYSTAL MATERIAL OF, OR FOR, COLLOID SYSTEM (E.G., G PHASE):**

This subclass is indented under the class definition. A collection of art which discloses subject matter relating to liquid crystal materials\* of or for colloid systems.

**SEE OR SEARCH CLASS:**

- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252. See subclasses 299.01+ for liquid crystal compositions.
- 523, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclass 171 for nonporous synthetic polymeric compositions having opalescent, pearlescent, or variegated color.

**901. SUBSTANTIALLY PURE CARBON (E.G., GRAPHITE, LAMP BLACK, CARBON BLACK, FULLERENES):**

This subclass is indented under the class definition. A collection of art which discloses subject matter relating to a colloid system comprising substantially pure carbon in one of its various forms such as graphite, lamp black, carbon black, fullerenes.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 32, for colloid systems in which the continuous liquid phase is primarily organic\* and the discontinuous phase is primarily solid or semisolid material\* which is primarily elemental car-

- bon, such as graphite or diamond dispersed or suspended in oil or other primarily organic\* continuous liquid phase.
- 38+, for colloid systems (e.g., emulsions, suspensions, or dispersions) in which the continuous liquid phase is aqueous and the discontinuous phase is primarily bituminous, coal, or carbon.

**SEE OR SEARCH CLASS:**

- 44, Fuel and Related Compositions, for compositions to be used either as a fuel or as a carbonaceous reductant, subclasses 280+ for solid carbonaceous fuel dispersed in a liquid medium.
- 106, Compositions: Coating or Plastic, subclasses 20+ for compositions specially designed for use as inks (e.g., marking, writing, printing, ink jet, crayon compositions), subclasses 472+ for materials or ingredients specialized for use as pigments, fillers, or aggregates in coating or plastic compositions wherein the composition contains carbon in the elemental form, e.g., carbon black, etc.
- 201, Distillation: Processes, Thermolytic, appropriate subclasses, for a process of making coke.
- 241, Solid Material Comminution or Disintegration, subclasses 15+ (particularly subclass 16) for processes for producing non-colloid suspensions of a solid in a liquid by comminuting operations, subclasses 38+ for apparatus which may produce suspensions of a solid in a liquid by comminuting operations, whether such suspensions be disclosed as colloidal or not.
- 252, Compositions, subclass 502 for compositions which either conduct or emit electrons and which contain as an ingredient elemental carbon.
- 423, Chemistry of Inorganic Compounds, subclasses 445+ for products or processes of making same wherein the product is free carbon in substantially pure form, such as, diamond, fullerenes.

- 502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, subclasses 416+, for sorbent compositions which are free carbon containing; the term "activated carbon" will be construed as indicating a composition comprising carbon and unidentified components, functioning as a sorbent for this class.
- 508, Solid Anti-Friction Device, Materials Therefor, Lubricant or Separant Compositions for Moving Solid Surfaces, and Miscellaneous Mineral Oil Compositions, subclasses 113+ for lubricants containing graphite, coal, or elemental Carbon which may be colloid-sized dispersion. This class is organized based upon the chemical constituents or chemical reactants of the composition or device; no subclass specifically provides for colloid systems or wetting agents, therefore such subject matter would be placed based upon its constituents as though it were a solution or mixture having no colloid system characteristic.

**902. GELLED EMULSION:**

This subclass is indented under the class definition. A collection of art which discloses subject matter relating to a colloid system comprising a solid matrix colloid system (gel) formed directly from an emulsion.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

98+, for gelled emulsion.

**903. TWO OR MORE GELLANTS:**

This subclass is indented under the class definition. A collection of art which discloses two or more gellants (gel agents\*) present in the composition or system.

**904. FERMENTATION FOAM BREAKING OR INHIBITING:**

This subclass is indented under the class definition. A collection of art which discloses foam breaking or inhibiting subject matter in the context of fermentation technology.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 115+, for similar subject matter related to breaking (resolving) or inhibiting of colloid systems with a continuous liquid phase and a discontinuous gas or vapor phase (foams).

SEE OR SEARCH CLASS:

- 435, Chemistry: Molecular Biology and Microbiology, subclasses 262+ for processes in which preexisting material or compound, which may include a hazardous or toxic waste, present in a composition or material containing a preexisting material, is contacted with an enzyme or immobilized enzyme micro-organism or plant or animal cells to isolate or recover the preexisting material which is chemically unchanged by the process and the hazardous or toxic waste is destroyed (especially subclass 262.5 for processes wherein hazardous or toxic waste such as oil spill is destroyed or converted into an environmentally safe substance, subclass 266 for processes of using enzyme or microorganism to liberate, separate, or purify by treating gas, emulsion, or foam, subclasses 281+ for processes of recovering petroleum or shale oil), and foreign art collection FOR 184 for method of using genetically engineered cells other than hybrid or fused cells for oil spill cleanup.

**905. AGENT COMPOSITION, PER SE, FOR COLLOID SYSTEM MAKING OR STABILIZING (E.G., FOAMING, EMULSIFYING, DISPERSING, GELLING; FOR WETTING AGENTS SEE 516/198+):**

This subclass is indented under the class definition. A collection of art which discloses a per se composition containing a colloid system making or stabilizing agent\* (e.g., foaming, emulsifying, dispersing, gelling), i.e., a composition containing said agent\* and lacking both dispersant\* and dispersand\*.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 1+, for subject matter relating to colloid systems having a continuous gas or vapor phase, such as smoke, fog, aerosol, cloud, mist, aerosolizing.
- 9+, for subject matter relating to colloid systems based on continuous liquid phase (e.g., foams, emulsions, suspensions, dispersions).
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system.

SEE OR SEARCH CLASS:

- 252, Compositions, for all those compositions for which there is no provision elsewhere in the USPCS; including those compositions (or appropriate methods) which are claimed as specifically intended for a special use or function, but which, if only generically claimed, would be proper for Class 516, provided that subject matter is hierarchically superior within Class 252. Areas known to have documents related to colloid systems or wetting agents include: subclass 3, 6.5, 8.05 for fire extinguishing foams, subclasses 610+ for fire retarding compositions in the form of dispersion or colloid system, subclasses 8.57, 8.61+, 8.81+, and 8.91+ for various specialized compositions for leather, fur, or textile treating, subclass 61 for froth flotation compositions used in physical separation, subclasses 182.11+ for compositions containing a single reactant or plural reactants specialized or designed for use in subsequent reactions with other materials, but not with each other (e.g., for producing foams), subclasses 186.1+ for compositions for bleaching by oxidation, or in other oxidation of extraneous substances, or in generating oxygen, subclasses

- 175+ for compositions for treating water to soften or purify it, to precipitate impurities in it, or to inhibit formation of scale or incrustation in steam boilers or other water containers, subclass 194 for a composition which is designed to remove or bind water which may be in the form of a gel or which forms a gel, subclass 363.5 for finely divided solids combined with an agent to facilitate dispersion, subclass 367.1 for soap containing compositions (these are alkali-metal (i.e., Li, Na, K, Rb, or Cs) salts of unsubstituted or hydroxy-substituted, saturated or unsaturated, higher fatty acids, or of rosin (abietic acids) which are of general utility and lack any shape or structure to adapt them for use as cleaning agents, subclasses 610+ for fire retarding compositions in the form of dispersion or colloid system, subclasses 634+ for radioactive compositions in the form of sol solution or gel.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, antiflocculants), subclasses 100+ for earth boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents (especially subclass 102 for compositions which may contain foam), subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents (especially subclass 202 for compositions which may contain foam), cross-reference art collection 922+ for fracture fluids which may be gels.
- 510, Cleaning Compositions for Solid Surfaces, Auxiliary Compositions Therefor, or Processes of Preparing the Compositions, appropriate subclasses for claimed or solely disclosed cleaning compositions for cleaning or removing foreign matter from solid surfaces which may be gel or paste. Although various subclasses specifically provide for colloid systems or wetting agents, such subject matter may be placed based upon another criterion, such as its chemical constitution (i.e., as though it has no colloid system characteristic). Areas known to have documents related to the per se surfactants used in colloid systems or wetting agents include: subclasses 405+ for liquid cleaning compositions, especially for chemically specified surfactants (particularly subclass 406 for gas-propelled, subclass 417 for plural immiscible liquid phases (e.g., emulsion, oily and aqueous layers), subclass 418 for liquid and solid phases (e.g., suspension, slurry)), subclass 514 for dishwasher rinse composition which may be a wetting agent, subclasses 535 for surfactant compositions (other than raw soap) which are specialized for use in cleaning compositions together with other auxiliary components (particularly subclass 537 for liquid or paste).
- 530, Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof, appropriate subclasses for colloid systems such as gel-like proteins; Areas known to have documents related to colloid systems or wetting agents include: subclasses 200+ for natural resin derivatives which are not pure compounds, and processes of treating natural resins or derivatives (e.g., wood, gum, and tall oil rosin; wood or pine tar or pitch; shellac; copals from various sources, both recent and fossil, such as Congo, Manila, etc.; amber; dammar; kauri; coal resin; gum accroides; sandarac; cativo resin).
906. **The agent contains organic compound containing silicon:**  
A collection of art under cross-reference art collection 905 in which the colloid system making or stabilizing agent\* contains organic\* compound containing silicon.



## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains silicon.
- 13, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains silicon.
- 23, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains silicon.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains silicon.
- 38+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\* compound which contains silicon.
- 55, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains silicon.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains silicon.
- 98+, for subject matter relating to colloid system having a continuous or semi-

continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.

- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains silicon.

**907. The agent contains organic compound containing phosphorus (e.g., lecithin):**

A collection of art under cross-reference art collection 905 in which the colloid system making or stabilizing agent\* contains organic\* compound containing phosphorus, such as, lecithin.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus.
- 13, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus.
- 24, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus.
- 40, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\*

- compound which contains phosphorus.
- 56+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus.
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains phosphorus.
- 908. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**  
A collection of art under cross-reference art collection 907 in which the colloid system making or stabilizing agent\* which contains an organic\* compound which contains phosphorus also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).
- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus and also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).
- 13, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus and also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).
- 24, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus and also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus and also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).
- 40, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus and also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).
- 57, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains phosphorus and also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which

- contains phosphorus and also contains repeating  $-(OC\ nH\ 2n)-$  (i.e., repeating unsubstituted oxyalkylene).
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains Phosphorus and also contains repeating  $-(OC\ nH\ 2n)-$  (i.e., repeating unsubstituted oxyalkylene).

**909. The agent contains organic compound containing sulfoxy\*:**

A collection of art under cross-reference art collection 905 in which the colloid system making or stabilizing agent\* contains organic\* compound containing sulfoxy\*.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\*.
- 14, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\*.
- 25+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\*.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\*.

- 41+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\*.
- 58+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\*.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\*.
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains sulfoxy\*.

**910. The compound contains nitrogen, except if present solely as NH 4+:**

A collection of art under cross-reference art collection 909 in which the colloid system making or stabilizing agent\* which contains organic\* compound containing sulfoxy\* also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains Nitrogen, except for when the nitrogen is

- present solely as the cationic ammonium group, NH 4+.
- 14, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 26, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 41+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 59+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 911. The compound contains -S(O 2)NHH where substitution may be made for the hydrogen:**  
A collection of art under cross-reference art collection 910 in which the organic\* compound contains -S(O 2)NHH group where substitution may be made for the hydrogen.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:**
- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -S(O 2)NHH group where substitution may be made for the hydrogen.
- 14, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -S(O 2)NHH group where substitution may be made for the hydrogen.
- 26, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or

- stabilizing which employs as an agent\* an organic\* compound which contains -S(O 2)NHH group where substitution may be made for the hydrogen.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -S(O 2)NHH group where substitution may be made for the hydrogen.
- 41+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -S(O 2)NHH group where substitution may be made for the hydrogen.
- 59+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -S(O 2)NHH group where substitution may be made for the hydrogen.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -S(O 2)NHH group where substitution may be made for the hydrogen.
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains -S(O 2)NHH group where substitution may be made for the hydrogen.
- 912. The compound contains -C(=O)NHH where substitution may be made for the hydrogen:**  
A collection of art under cross-reference art collection 910 in which the organic\* compound containing sulfoxy\* also contains -C(=O)NHH group where substitution may be made for the hydrogen.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:**
- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)NHH group where substitution may be made for the hydrogen.
- 14, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)NHH group where substitution may be made for the hydrogen.
- 26, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)NHH group where substitution may be made for the hydrogen.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)NHH group where substitution may be made for the hydrogen.
- 41+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\*

- compound which contains sulfoxy\* and also contains -C(=O)NHH group where substitution may be made for the hydrogen.
- 59+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)NHH group where substitution may be made for the hydrogen.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)NHH group where substitution may be made for the hydrogen.
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)NHH group where substitution may be made for the hydrogen.

**913. The compound contains -C(=O)OH or salt thereof:**

A collection of art under cross-reference art collection 909 in which the colloid system making or stabilizing agent\* which contains organic\* compound containing sulfoxy\* also contains -C(=O)OH group or salt thereof.

- (1) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters (-C(=O)OR where R is an organic\* group).

**SEE OR SEARCH THIS CLASS, SUB-CLASS:**

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)OH group or salt thereof.
- 14, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)OH group or salt thereof.
- 25+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)OH group or salt thereof.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)OH group or salt thereof.
- 41+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)OH group or salt thereof.
- 58+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)OH group or salt thereof.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous)

- solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)OH group or salt thereof.
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains sulfoxy\* and also contains -C(=O)OH group or salt thereof.

**914. The agent contains organic compound containing nitrogen, except if present solely as NH 4+:**

A collection of art under cross-reference art collection 905 in which the colloid system making or stabilizing agent\* contains organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.

**SEE OR SEARCH THIS CLASS, SUB-CLASS:**

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 15+, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 27, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or

- stabilizing which employs as an agent\* an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 43+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 67+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH 4+.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen, except for when the Nitrogen is present solely as the cationic ammonium group, NH 4+.
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains

nitrogen, except for when the nitrogen is present solely as the cationic ammonium group, NH<sup>4+</sup>.

**915. The compound contains -C(=O)NHH where substitution may be made for the hydrogen:**

A collection of art under cross-reference art collection 914 in which the colloid system making or stabilizing agent\* contains organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen.

15+, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen.

27, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen.

31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen.

43+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which

employs as an agent\* an organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen.

67+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen.

77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen.

98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.

113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains -C(=O)NHH group where substitution may be made for the hydrogen.

**916. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

A collection of art under cross-reference art collection 914 in which the colloid system making or stabilizing agent\* which contains organic\* compound containing nitrogen also contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene), except for when the nitrogen is present solely as the cationic ammonium group, NH<sup>4+</sup>.

(1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.



## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen and also contains repeating  $-(OC\ nH\ 2n)-$  (i.e., repeating unsubstituted oxyalkylene), except for when the nitrogen is present solely as the cationic ammonium group,  $NH\ 4+$ .
- 15+, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen and also contains repeating  $-(OC\ nH\ 2n)-$  (i.e., repeating unsubstituted oxyalkylene), except for when the nitrogen is present solely as the cationic ammonium group,  $NH\ 4+$ .
- 27, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen and also contains repeating  $-(OC\ nH\ 2n)-$  (i.e., repeating unsubstituted oxyalkylene), except for when the nitrogen is present solely as the cationic ammonium group,  $NH\ 4+$ .
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen and also contains repeating  $-(OC\ nH\ 2n)-$  (i.e., repeating unsubstituted oxyalkylene), except for when the nitrogen is present solely as the cationic ammonium group,  $NH\ 4+$ .
- 43+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which

employs as an agent\* an organic\* compound which contains nitrogen and also contains repeating  $-(OC\ nH\ 2n)-$  (i.e., repeating unsubstituted oxyalkylene), except for when the nitrogen is present solely as the cationic ammonium group,  $NH\ 4+$ .

- 67+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen and also contains repeating  $-(OC\ nH\ 2n)-$  (i.e., repeating unsubstituted oxyalkylene), except for when the nitrogen is present solely as the cationic ammonium group,  $NH\ 4+$ .
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains nitrogen and also contains repeating  $-(OC\ nH\ 2n)-$  (i.e., repeating unsubstituted oxyalkylene), except for when the nitrogen is present solely as the cationic ammonium group,  $NH\ 4+$ .
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains nitrogen and also contains repeating  $-(OC\ nH\ 2n)-$  (i.e., repeating unsubstituted oxyalkylene), except for when the nitrogen is present solely as the cationic ammonium group,  $NH\ 4+$ .

**917. The agent contains organic compound containing oxygen:**

A collection of art under cross-reference art collection 905 in which the colloid system making or stabilizing agent\* contains organic\* compound which contains oxygen.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains oxygen.
- 18+, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains oxygen.
- 28+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains oxygen.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains oxygen.
- 46+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\* compound which contains oxygen.
- 72+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains oxygen.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains oxygen.
- 98+, for subject matter relating to colloid system having a continuous or semi-

continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.

- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains oxygen.

**918. The compound contains carboxylic acid ester group:**

A collection of art under cross-reference art collection 917 in which the colloid system making or stabilizing agent\* contains carboxylic acid ester group.

## SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains carboxylic acid ester group.
- 18+, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains carboxylic acid ester group.
- 28+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains carboxylic acid ester group.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains carboxylic acid ester group.
- 46+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\*

- compound which contains carboxylic acid ester group.
- 73+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains carboxylic acid ester group.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains carboxylic acid ester group.
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains carboxylic acid ester group.

**919. The compound contains -C(=O)OH or salt thereof:**

A collection of art under cross-reference art collection 917 in which the colloid system making or stabilizing agent\* contains -C(=O)OH group or salt thereof.

- (1) Note. "-C(=O)OH group or salt thereof" does NOT include carboxylic acid esters (-C(=O)OR where R is an organic\* group).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)OH group or salt thereof.
- 18+, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of

- making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)OH group or salt thereof.
- 28+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)OH group or salt thereof.
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)OH group or salt thereof.
- 46+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)OH group or salt thereof.
- 75+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)OH group or salt thereof.
- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains -C(=O)OH group or salt thereof.
- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.
- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an

organic\* compound which contains -C(=O)OH group or salt thereof.

**920. The compound contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene):**

A collection of art under cross-reference art collection 917 in which the colloid system making or stabilizing agent\* contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

- (1) Note. "Repeating -(OC nH 2n)-" means 2 or more, bonded directly to each other. Thus, this subclass requires at least two ether linkages; monoether derivatives are located elsewhere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 1+, for colloid system having a continuous gas or vapor phase (such as, smoke, fog, aerosol, cloud, mist) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).
- 18+, for colloid system of continuous liquid phase and a discontinuous gas or vapor phase (i.e., foam) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).
- 28+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily inorganic\* liquid (e.g., water-in-oil emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).
- 31+, for colloid system of primarily organic\* continuous liquid phase and a discontinuous phase primarily solid or semisolid material\* or method of making or stabilizing which employs as an agent\* an organic\* compound which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

- 46+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily bituminous or method of making or stabilizing which employs as an agent\* an organic\* compound which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

- 76, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily organic\* liquid (e.g., oil-in-water emulsion) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

- 77+, for colloid system of aqueous continuous liquid phase and a discontinuous phase primarily (non-bituminous) solid (e.g., water based suspensions, dispersions, sols) or method of making or stabilizing which employs as an agent\* an organic\* compound which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

- 98+, for subject matter relating to colloid system having a continuous or semi-continuous solid phase (i.e., systems which exhibit plasticity, elasticity, or rigidity), such as gel, paste, gelled emulsion, floc.

- 113+, for subject matter relating to breaking (resolving) or inhibiting a colloid system which employs as an agent\* an organic\* compound which contains repeating -(OC nH 2n)- (i.e., repeating unsubstituted oxyalkylene).

**921. COLLOID SYSTEMS HAVING SPECIFIED HIGH PURITY (E.G., ULTRA-PURE SILICA):**

This subclass is indented under the class definition. A collection of art which discloses colloid systems having specified high purity, such as, ultra-pure silica.

**922. COLLOID SYSTEMS HAVING SPECIFIED PARTICLE SIZE, RANGE, OR DISTRIBUTION (E.G., BIMODAL PARTICLE DISTRIBUTION):**

This subclass is indented under the class definition. A collection of art which discloses colloid systems having specified particle size,

range, or distribution, such as, having a bimodal particle distribution.

**923. Emulsion:**

A collection of art under cross-reference art collection 922 in which the colloid system is an emulsion.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 20, for subject matter related to oil-in-oil emulsion.
- 21+, for subject matter related to water-in-oil emulsion.
- 53+, for subject matter related to oil-in-water emulsion.

**924. SIGNIFICANT DISPERSIVE OR MANIPULATIVE OPERATION OR STEP IN MAKING OR STABILIZING COLLOID SYSTEM:**

This subclass is indented under the class definition. A collection of art which discloses a significant dispersive or manipulative operation or step in making or stabilizing a colloid system.

SEE OR SEARCH CLASS:

- 366, Agitating, subclasses 69+ for apparatus which may be used for working liquid into a gel, subclasses 101+ for apparatus which includes agitation and injection of gas which may be a foam, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, subclasses 279+ for apparatus with rotatable stirrer which may be used for making lather or foam, and cross-reference art collection 604 for mixing apparatus for making foam or lather, cross-reference art collection 605 for mixing apparatus for stirring of paint.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for addition to petroleum oils during transportation through conduits to prevent fouling or clogging of the conduits due to components of the petroleum oils precipitating out during the transportation (e.g., suspending agents, anti-flocculants), subclasses 100+ for earth

boring compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents (especially subclass 102 for compositions which may contain foam), subclasses 200+ for well treating compositions which may contain colloid systems (e.g., dispersions, suspensions, emulsions) or wetting agents (especially subclass 202 for compositions which may contain foam), cross-reference art collection 922+ for fracture fluids which may be gels.

**925. Phase inversion:**

A collection of art under cross-reference art collection 924 which discloses an operation or a step of phase inversion, such as oil-in-water inverted to water-in-oil.

**926. Phase change (e.g., melting):**

A collection of art under cross-reference art collection 924 which discloses an operation or a step of phase change, such as melting.

**927. In situ formation of a colloid system making or stabilizing agent which includes a chemical reaction:**

A collection of art under cross-reference art collection 924 which discloses an operation or a step of an in situ formation of colloid system making or stabilizing agent\* which includes a chemical reaction.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 39, for subject matter relating to colloid system containing a colloid system making or stabilizing agent\*, which is formed in situ from at least one native precursor by adding inorganic\* alkaline material\* to the colloid system or a precursor of it, such as adding NaOH or TSP (trisodium phosphate) to a natively present acid,.

**928. Mixing combined with non-mixing operation or step, successively or simultaneously (e.g., heating or cooling, pH change, ageing, milling):**

A collection of art under cross-reference art collection 924 which discloses an operation or a step of mixing combined with non-mixing

operation or step, successively or simultaneously, such as, heating, cooling, pH change, ageing.

**SEE OR SEARCH CLASS:**

366, Agitating, subclasses 69+ for apparatus which may be used for working liquid into a gel, subclasses 101+ for apparatus which includes agitation and injection of gas which may be a foam, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, subclasses 279+ for apparatus with rotatable stirrer which may be used for making lather or foam, and cross-reference art collection 604 for mixing apparatus for making foam or lather, cross-reference art collection 605 for mixing apparatus for stirring of paint.

522, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclass 3 for processes of forming or modifying a solid polymer wherein wave energy is employed and wherein specified mixing, stirring, agitating, movement of material or directional orientation is employed; or compositions therefore,

**929. Specified combination of agitation steps (e.g., mixing to make subcombination composition followed by homogenization):**

A collection of art under cross-reference art collection 924 which discloses specified combination of agitation steps, such as, mixing to make subcombination composition followed by homogenization.

**SEE OR SEARCH CLASS:**

366, Agitating, subclasses 69+ for apparatus which may be used for working liquid into a gel, subclasses 101+ for apparatus which includes agitation and injection of gas which may be a foam, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, subclasses 279+ for apparatus with rotatable stirrer which may be used for making

lather or foam, and cross-reference art collection 604 for mixing apparatus for making foam or lather, cross-reference art collection 605 for mixing apparatus for stirring of paint.

522, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclass 3 for processes of forming or modifying a solid polymer wherein wave energy is employed and wherein specified mixing, stirring, agitating, movement of material or directional orientation is employed; or compositions therefore,

**930. Low shear followed by high shear:**

A collection of art under cross-reference art collection 929 which discloses a low shear step followed by a high shear step.

**SEE OR SEARCH CLASS:**

366, Agitating, subclasses 69+ for apparatus which may be used for working liquid into a gel, subclasses 101+ for apparatus which includes agitation and injection of gas which may be a foam, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, subclasses 279+ for apparatus with rotatable stirrer which may be used for making lather or foam, and cross-reference art collection 604 for mixing apparatus for making foam or lather, cross-reference art collection 605 for mixing apparatus for stirring of paint.

522, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclass 3 for processes of forming or modifying a solid polymer wherein wave energy is employed and wherein specified mixing, stirring, agitating, movement of material or directional orientation is employed; or compositions therefore,

**931. High shear followed by low shear:**

A collection of art under cross-reference art collection 929 which discloses a high shear step followed by low shear step.

**SEE OR SEARCH CLASS:**

- 366, Agitating, subclasses 69+ for apparatus which may be used for working liquid into a gel, subclasses 101+ for apparatus which includes agitation and injection of gas which may be a foam, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclasses 176.1+ for apparatus for forming suspensions or emulsions by agitation, subclasses 279+ for apparatus with rotatable stirrer which may be used for making lather or foam, and cross-reference art collection 604 for mixing apparatus for making foam or lather, cross-reference art collection 605 for mixing apparatus for stirring of paint.
- 522, Synthetic Resins or Natural Rubbers--Part of the Class 520 Series, subclass 3 for processes of forming or modifying a solid polymer wherein wave energy is employed and wherein specified mixing, stirring, agitating, movement of material or directional orientation is employed; or compositions therefore.

**FOREIGN ART COLLECTIONS**

The definitions below correspond to abolished subclasses from which these collections were formed. See the Foreign Art Collection Schedule of this class for specific correspondences. [Note: the titles and definitions for indented art collections include all the details of the one(s) that are hierarchically superior.]

**FOR 100.**

Foreign art collections including compositions which are colloid systems; processes of making or of resolving (breaking) the same; gels, coagulates; potential dispersands (compositions containing in each case a material adapted to be colloidally dispersed and a substance for colloidally dispersing or stabilizing a colloidal dispersion of the same); processes of using colloid systems; compositions specialized and designed for use in, or peculiar to, such systems, gels, coagulates, dispersands, or processes, including wetting agents, substances for stabilizing, resolving, or inhibiting formation

of such systems, and for dispersing materials.

**FOR 101.**

Foreign art collections including (1) separating two or more materials, which differ from each other either chemically or merely physically, or (2) comminuting or preparing materials in a finely-divided state, as final products substantially free from colloid stabilizers therefor, by procedures which comprise formations of resolutions of colloid systems or use of such systems as agents, or (3) products made by such processes.

**FOR 102.**

Foreign art collections including colloid systems or processes of making the same.

**FOR 103.**

Foreign art collections including colloid systems in which the outermost continuous phase (outermost dispersion medium) is a gas, or processes of making the same.

**FOR 104.**

Foreign art collections including colloid systems in which the outermost continuous phase (outermost dispersion medium) is a liquid, or processes of making the same.

**FOR 105.**

Foreign art collections including colloid systems which include a gas directly dispersed in the outermost (liquid) phase, or processes of making the same.

**FOR 106.**

Foreign art collections including colloid systems in which the major part of the outermost continuous phase consists of one or more organic compounds, or processes of making the same.

**FOR 107.**

Foreign art collections including colloid systems in which the major part of the solid or liquid matter, directly dispersed in the outermost phase, consists of one or more chemical elements or inorganic compounds.

**FOR 108.**

Foreign art collections including colloid systems in which the major part of the outer-

most continuous phase consists of water, or processes of making the same.

**FOR 109.**

Foreign art collections including colloid systems in which the major part of the solid or liquid matter directly dispersed in the outermost phase consists of one or more organic compounds.

**FOR 110.**

Foreign art collections including colloid systems wherein the dispersands comprise a bituminous material which is usually a solid or semi-solid hydrocarbon such as, for example, asphalt, pitch, tar or paraffin wax.

**FOR 111.**

Foreign art collections including colloid systems in which the matter directly dispersed in the outermost phase is an oil or is in a liquid state.

**FOR 112. Inorganic major dispersands only:**

Foreign art collections including colloid systems in which the major part of the solid or liquid matter directly dispersed in the outermost phase consists of one or more chemical elements or inorganic compounds.

**FOR 113. Silica:**

Foreign art collections including subject matter wherein silica is the chemical element or in the inorganic compound.

**FOR 114.**

Foreign art collections including processes which include making colloid systems in which in each case the outermost continuous phase is a liquid.

**FOR 115. Gels, coagulates, or dispersands:**

Foreign art collections including subject matter that includes a gel, coagulate or a potential dispersand, i.e., a composition which contains a material, adapted to be colloidally dispersed, admixed with a substance either for colloidally dispersing or stabilizing a colloidal dispersion or processes of making thereof.

**FOR 116. Organic:**

Foreign art collections including subject matter wherein the composition contains organic material.

**FOR 117. Inorganic material coated, impregnated, or surface-modified with organic material:**

Foreign art collections including subject matter wherein inorganic material has been rendered organophilic by coating, impregnating or surface-modifying with organic material.

**FOR 118. Carbohydrate or derivative:**

Foreign art collections including subject matter wherein the organic material is a carbohydrate or derivative thereof.

**FOR 119. Carboxylic acid ester, acid, or salt thereof:**

Foreign art collections including subject matter wherein the organic material is a carboxylic acid ester, acid or salt thereof.

**FOR 120. Metal silicate or clay:**

Foreign art collections including subject matter wherein the composition contains a metal silicate or clay, e.g., bentonite, kaolin, etc.

**FOR 121. Silica:**

Foreign art collections including subject matter wherein the composition contains silica.

**FOR 122. Alumina:**

Foreign art collections including subject matter wherein the composition contains alumina.

**FOR 123.**

Foreign art collections including compositions which include material which, per se, is adapted to a colloidally disperse, or be colloidally dispersed, or function as a colloid dispersion medium, and a substance for preventing or inhibiting colloidal dispersal of or in such material.

**FOR 124.**

Foreign art collections including processes which include breaking an emulsion; separating part or all of any colloidally dispersed phase or colloid dispersion medium from



part, or all, of any other phase of a colloid system; destroying the colloidal dispersion state of part or all of any colloiddally dispersed phase; inhibiting formation of an emulsion or other colloid system, or inhibiting colloidal dispersal of matter.

**FOR 125.**

Foreign art collections including processes in which the colloid systems treated or formations thereof inhibited, include in each case a colloid system in which the outermost continuous phase (outermost dispersion medium) is a liquid.

**FOR 126.**

Foreign art collections including processes in which the substance directly dispersed in the outermost phase of the colloid system treated, or formation thereof inhibited, is a gas.

**FOR 127.**

Foreign art collections including processes which include bringing the materials to be treated into contact with solid agents which function as adsorbents, solid physical absorbents, differential adherence surfaces, or otherwise as loose particulate solid matter functioning physically only.

**FOR 128.**

Foreign art collections including processes in which the treating substance contains both an organic compound and a free chemical element or an inorganic compound, other than water.

**FOR 129.**

Foreign art collections including processes in which the treating substances contain free chemical elements or inorganic compounds, other than water.

**FOR 130.**

Foreign art collections including processes in which the treating substances contain organic compounds.

**FOR 131.**

Foreign art collections including processes which include adding solid or liquid treating substances other than the principal components of the material treated.

**FOR 132.**

Foreign art collections including processes which include adding treating substances, other than mere carrier-solvents for other treating agents, and other than the principal components of the material treated in each case, which physically or chemically dissolve, bind, or destroy, part or all of the colloiddally dispersed substances or colloid dispersion media, other than the stabilizing agents or which are liquid baths.

**FOR 133.**

Foreign art collections including processes under subclass 326 in which the colloid systems treated, or formation thereof inhibited, include colloidal dispersions of water in petroleum or hydrocarbons or vice versa.

**FOR 134.**

Foreign art collections including processes in which the added treating substance includes both an organic compound and a free chemical element or an inorganic compound other than water.

**FOR 135.**

Foreign art collections including processes in which the added treating substance includes a free chemical element or inorganic compound other than water.

**FOR 136.**

Foreign art collections including processes in which the added treating substance includes an organic compound.

**FOR 137.**

Foreign art collections including processes in which the added substance includes an organic compound which contains a sulfo or sulfate radical or sulfur joined directly to oxygen.

**FOR 138.**

Foreign art collections including processes in which the added substance includes an organic compound produced by treating petroleum or fraction thereof with sulfuric acid or other sulfonating agent.

**FOR 139.**

Foreign art collections including processes in which the added substance includes an organic amine, amide, or nitrogen-base radical.

**FOR 140.**

Foreign art collections including processes in which the added substance includes a protein or an organic compound having a carboxyl radical.

**FOR 141.**

Foreign art collections including processes in which the added substance includes an organic amine, amide, or nitrogen-base radical.

**FOR 142.**

Foreign art collections including processes in which an added sulfoxy or carboxylic compound contains a carbon ring or is not an aliphatic compound.

**FOR 143.**

Foreign art collections including processes in which the added substance includes an organic amine, amide, or nitrogen-base radical.

**FOR 144.**

Foreign art collections including processes in which the added substance includes an organic compound which does not contain a sulfo or sulfate radical, sulfur joined directly to oxygen, or a carboxyl, amine, amide, or nitrogen-base radical.

**FOR 145.**

Foreign art collections including processes in which the added substance includes a protein or an organic compound having a carboxyl radical.

**FOR 146.**

Foreign art collections including processes in which the added substance includes an organic amine, amide, or nitrogen-base radical.

**FOR 147.**

Foreign art collections including processes in which an added carboxylic compound contains a carbon ring or is not an aliphatic compound.

**FOR 148.**

Foreign art collections including processes in which the added treating substance includes an organic compound which does not contain a carboxylic, amine, amide, or nitrogen-base radical.

**FOR 149.**

Foreign art collections including processes in which the added substance includes an organic amine, amide, or nitrogen-base radical.

**FOR 150.**

Foreign art collections including processes in which the added treating substance comprises an organic compound which contains an element other than carbon, hydrogen, and oxygen.

**FOR 151.**

Foreign art collections including processes which include vaporizing, heating, or cooling part, or all, of any phase.

**FOR 152.**

Foreign art collections including processes which include mechanical treatment.

**FOR 153.**

Foreign art collections including processes which include addition, to the material being treated of one or more of the principal components thereof.

**FOR 154.**

Foreign art collections including processes which include filtering, centrifuging, mechanical shock or other mechanical treatment.

**FOR 155.**

Foreign art collections including compositions for use in producing foams which comprise in each case a foam-stabilizing agent and a substance for use in generating a gas chemically or otherwise.

**FOR 156.**

Foreign art collections including compositions which comprise wetting, emulsifying, foam-stabilizing or colloid dispersing or sta-

bilizing agents, or processes of making such compositions.

**FOR 157.**

Foreign art collections including compositions which comprise both an organic compound and a free chemical element or an inorganic compound other than water, or processes of making such compositions.

**FOR 158.**

Foreign art collections including compositions which comprise organic compounds which contain a sulfo or sulfate radical or sulfur joined directly to oxygen, or processes of making such compositions.

**FOR 159.**

Foreign art collections including compositions which comprise proteins or organic compounds which contain carboxyl radicals, or processes of making such compositions.

**FOR 160.**

Foreign art collections including compositions which comprise organic compounds which contain amine, amide or nitrogen-base radicals, or processes of making such compositions.

**FOR 161.**

Foreign art collections including compositions which comprise proteins or organic compounds which contain carboxyl radicals, or processes of making such compositions.

**FOR 162.**

Foreign art collections including compositions which comprise organic compounds which contain amine, amide, or nitrogen-base radicals, or processes of making such compositions.

**FOR 163.**

Foreign art collections including compositions which are substances for use in breaking emulsions or resolving colloid systems, or inhibiting formation of emulsions or other colloids, in which the primary dispersants are liquids, or processes of making such compositions.

END